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(71)Applicant : CANON INC

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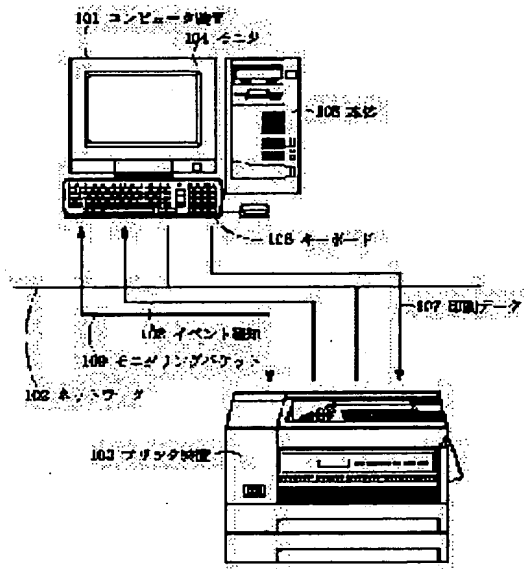
(72)Inventor : OCHIAI MASAHIITO

(54) PRINTING SYSTEM, STATE MONITORING METHOD FOR PRINTING SYSTEM, AND COMPUTER-READABLE STORAGE MEDIUM STORAGE WITH PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To automate a monitoring process for displaying the state of a printer receiving a print job at a display part by controlling an information destination of the state of the printer changing as the printer side processes the print job and transferring it to a data processor controlling packets at proper time.

SOLUTION: A computer device 101 sends print data 107 to a printer device 103 through a network 102. The printer device 103 once receiving the print data 107 sends an event report 108 to a computer device 101 through the network 102 according to the status of the printer device 103. Further, the computer device 101 sends and receives monitoring packets 109 to and from the printer device 103 to monitor the status of the printer device 103. Then packets received from the printer device 103 are analyzed to monitor the state of the printer device 103, and the monitoring contents are displayed on a monitor 104.



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CLAIMS

[Claim(s)]

[Claim 1] A conversion means by which a data processor and an airline printer are the printing systems in which packet communication is possible, and change the data from application into the print data based on predetermined print language through predetermined communication media, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, The printing system characterized by equipping said data processor with the control means which analyzes the packet which receives from said airline printer after transmission of said print data, and controls the initiation or termination of the house keeping of said airline printer by said monitor means.

[Claim 2] An analysis means for a data processor and an airline printer to be the printing systems in which packet communication is possible, and to analyze the print job received from said data processor through predetermined communication media, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, The control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes to the sequential aforementioned data processor, The printing system characterized by preparing for the aforementioned airline printer.

[Claim 3] A conversion means by which a data processor and an airline printer are the printing systems in which packet communication is possible, and change the data from application into the print data based on predetermined print language through predetermined communication media, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data. An analysis means to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, The control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes to the sequential aforementioned data processor, The printing system characterized by preparing for the aforementioned airline printer.

[Claim 4] The condition of said said changing airline printer is a printing system according to claim 2 or 3 characterized by including the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer.

[Claim 5] A data processor and an airline printer are the house keeping approaches of the printing system in which packet communication is possible through predetermined communication media. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, The 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor, The house keeping approach of the printing system characterized by ****(ing).

[Claim 6] It is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, The 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor, The storage which stored the program which the computer characterized by ****(ing) can read.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the storage with which the data processor and the airline printer stored the house keeping approach of the printing system in which packet communication is possible, and a printing system, and the program which a computer can read through predetermined communication media.

[0002]

[Description of the Prior Art] When printing in this kind of printing system conventionally with the printer equipment which minded the network, for example, with the computer apparatus, to the printer equipment assigned logically, a user transmits print data and is performing printing processing.

[0003] In order for a user to know what the condition of that printer equipment has become, or how the print data which the user performed are processed by the printer at this time, a user needs to specify the printer equipment assigned logically or physically.

[0004] That is, the user was performing monitoring of the status of printer equipment to which printer equipment on a network being conscious of whether printing processing is made.

[0005]

[Problem(s) to be Solved by the Invention] However, when carrying out monitoring of the status of the printer equipment with which the user performed printing, it must know which printer equipment on a network the printer equipment which the computer assigned logically is actually.

[0006] Moreover, the user needed to start the program for carrying out monitoring of the status of printer equipment, and there was a trouble that operability was bad.

[0007] This invention is what was made in order to cancel the above-mentioned trouble. The purpose of this invention By transmitting to the data processor which manages the notice place which should notify the condition of the airline printer which changes in case the airline printer side which transmitted the print job from a user processes this print job, and manages a packet timely Without forcing it the operator guidance by the user It is offering the storage which stored the house keeping approach of the printing system which can automate the monitor processing to which the condition of an airline printer of having received the transmitted print job is displayed on a display, and a printing system, and the program which a computer's can read.

[0008]

[Means for Solving the Problem] The 1st invention concerning this invention is a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of

said print data.

[0009] An analysis means for the 2nd invention concerning this invention to be a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media, and to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, After notifying to said packet by said transmitting means, Said airline printer is equipped with the control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor.

[0010] The 3rd invention concerning this invention is a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data. An analysis means to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, After notifying to said packet by said transmitting means, Said airline printer is equipped with the control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor.

[0011] As for the 4th invention concerning this invention, the condition of said said changing airline printer includes the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer.

[0012] The 5th invention concerning this invention is the house keeping approach of the printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, It has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor after notifying to said packet by said 1st notice process.

[0013] The 6th invention concerning this invention is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the

printing system in which packet communication is possible through predetermined communication media can read. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, It has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor after notifying to said packet by said 1st notice process.

[0014]

[Embodiment of the Invention]

The [1st operation gestalt] Drawing 1 is drawing explaining the printing structure of a system which shows the 1st operation gestalt of this invention.

[0015] In drawing, 101 is the computer apparatus of this operation gestalt, and consists of a body 105 with which the monitor 104, the hard disk, and CPU are stored, and a keyboard 106 which receives the key input from a user.

[0016] 103 is the airline printer (printer equipment) which is adapted in this operation gestalt, for example, in the case of a laser beam printer (following, LBP), corresponds. 102 is networks, such as Ethernet, and connects a computer apparatus 101 and printer equipment 103 possible [a communication link] with a predetermined protocol.

[0017] With this operation gestalt, a computer apparatus 101 transmits print data 107 to printer equipment 103 through a network 102. Moreover, printer equipment 103 will transmit the notice 108 of an event to a computer apparatus 101 through a network 102 according to the status of printer equipment 103, if print data 107 are received. Furthermore, a computer apparatus 101 sends and receives printer equipment 103 and the monitoring packet 109, and supervises the status of printer equipment 103.

[0018] Drawing 2 is the block diagram showing the outline of the internal configuration of the computer apparatus 101 shown in drawing 1.

[0019] In drawing, 201 is CPU and starts data processing by the boot rise program memorized by ROM202. 203 is RAM, various data are temporarily stored as a work piece of CPU201, or a program is loaded. 208 is a hard disk, and various programs (an application program is included) are stored and it is accessed by CPU201 through the HD control section 205.

[0020] 206 is the I/O-hardware-control section and controls the I/O from monitors 104 and keyboards 106, such as CRT, FLC, and LCD, and a pointing device. 207 is a network I/F control section and controls the communication link with a network 102. Each [these] control section is accessed from CPU201 through the CPU bus 204.

[0021] Drawing 3 is the block diagram showing the outline of the program configuration of the computer apparatus 101 shown in drawing 1.

[0022] In drawing, 301 is a general-purpose application module and operates on a computer apparatus 101. 302 is a printer driver module and changes an application data into the print data of the printing data format of printer equipment 103 according to the demand from the general-purpose application module 301.

[0023] 307 is a printing protocol module and is a module which transmits the print data changed into the printing data format by the printer driver module 302 as print data to the printer equipment 101 on a network 102 through a communication module 303.

[0024] 304 is a network driver module and controls the network I/F control section 207 of drawing

2. 305 is a monitoring application module and supervises the condition of printer equipment 103, and the condition of printing. From the hard disk 208 of a computer apparatus 101, these modules are loaded on RAM203 by CPU201, and operate by it.

[0025] In addition, with this operation gestalt, the printer equipment 103 in which the above-mentioned monitoring application module. 305 carries out monitoring is selected without a user's mediation, and it supervises so that the condition of printing may be mentioned later.

[0026] Drawing 4 is the block diagram showing the outline of the internal configuration of the printer equipment 103 shown in drawing 1.

[0027] In drawing, 401 is CPU, performs the various control programs memorized by ROM402 or the memory resource which is not illustrated, and controls the printer equipment 103 whole. 403 is RAM and functions mainly as work-piece memory of CPU401. 404 is a bus and each control section mentioned later is connected.

[0028] 405 is an engine control section and controls the LBP engine 411. 406 is the I/O-hardware-control section and controls the I/O from monitors 104 and keyboards 106, such as CRT, FLC, and LCD, and a pointing device. 407 is the data I/O-hardware-control section, performs input/output control of the data from the outside, and controls the extended I/F control section 408 and the parallel I/F control section 409. In addition, the extended I/F control section 408 has connected with a network board 420 through the add-in board bus 410.

[0029] A network board 420 consists of ROM415 in which the program which CPU414 and this CPU414 should perform is stored, RAM416 which functions as a work piece of this CPU414, the extended I/F control section 418 which controls I/O with the add-in board bus 410, a network I/F control section 419 which communicates with a network 102, and bus 417 grade which connects each above-mentioned device.

[0030] In addition, the data inputted from the network I/F control section 419 are controlled by CPU414, and are transmitted to printer equipment 103 through the extended I/F control section 418 as print data with various kinds of modules shown in drawing 5 mentioned later.

[0031] Drawing 5 is the schematic diagram showing the program configuration of the network board 420 shown in drawing 4, and has given the same sign to the same thing as drawing 4.

[0032] In drawing, 501 is a printer I/F driver module, controls the extended I/F control section 418 of drawing 4, and functions as a module which performs transmission and reception of printer equipment 103 and data. 502 is a printing protocol module and functions as a module which supports the general-purpose printing protocol on a network 102.

[0033] 503 is a network protocol communication module and functions as a module which performs communications control of a network 102. 504 is a network driver module and is a routine which controls the network I/F control section 419 of drawing 4, sends out a packet or actually receives a packet on a network 102.

[0034] In addition, in the program of a network board 420, the printing protocol module 502 receives the print data from a computer apparatus 101 from a network 102 using the network protocol communication module 503 according to the printing communication procedure decided with the protocol, for example. And the received this print data are sent out to printer equipment 103 through the printer I/F driver module 501. 505 is a notice module of a job and transmits the job condition of printer equipment 103 to the computer apparatus 101 on a network 102.

[0035] Drawing 6 is the schematic diagram showing the program configuration of the printer equipment 103 shown in drawing 1.

[0036] In drawing, 605 is an extended I/F driver module and controls the extended I/F control section 408 which receives a job from the network board 420 of drawing 4. 606 is a parallel I/F driver module and controls the parallel I/F control section 409 of drawing 4. 604 is a print job receiving module and will receive a job from the extended I/F driver module 605 with this operation gestalt.

[0037] the module which manages as a job the data which 603 is a job management module and were received from the print job receiving module 604 — ** — it carries out, and it functions and this job is passed to the drawing module 602. And by the drawing module 602, print data are developed to a bit map.

[0038] 601 is a printer engine driver module, it functions as a module which controls the engine

control section 405 which controls the LBP engine 411 of drawing 4 , and the print data developed by the bit map are sent and printed by the LBP engine 411 with the printer engine driver module 601.

[0039] Moreover, the printer engine driver module 601 controls the engine control section 405 of drawing 4 , supervises the condition of the LBP engine 411, and notifies a jam, printing termination, etc. to the job management module 603.

[0040] Drawing 7 is the schematic diagram showing a format of the printing job data transmitted to printer equipment 103 from the computer apparatus 101 shown in drawing 1 .

[0041] In drawing, 701 is job-data length and the length of job data 702 is stored. Job data 702 consist of the notice protocol type 703, the notice place protocol address 704, the notice place port number 705, a job ID 706, print-data length 707, and print data 708.

[0042] In addition, the protocol type at the time of printer equipment 103 transmitting a notice packet is stored in the notice place protocol type 703. Since a computer apparatus 101 receives this notice packet from printer equipment 103 with this operation gestalt, the protocol type which the computer apparatus 101 is using is stored in this area.

[0043] Moreover, the address of the protocol at the time of printer equipment 103 transmitting a notice packet is stored in the notice place protocol address 704. Since a computer apparatus 101 receives this notice packet from printer equipment 103 with this operation gestalt, the protocol address of a computer apparatus 101 is stored in this area.

[0044] Furthermore, the port number of the protocol at the time of printer equipment 103 transmitting a notice packet is stored in the notice place port number 705. With this operation gestalt, the port number to which the monitoring application 305 of a computer apparatus 101 is carrying out waiting for a packet to the communication module 303 is stored in this area.

[0045] Moreover, a job ID 706 shows ID of the job which a computer apparatus 101 assigns to arbitration. Furthermore, the print-data length which shows the die length of the actual print data 708 was set to the print-data length 707, and the job management module 603 of printer equipment 103 considered that the data for this length were one job, and is managed. In addition, in this operation gestalt, it has composition which a network board 420 generates the notice packet of a network from a notice packet, and a call and this notice packet, and notifies the packet which shows the condition of the job notified to a network board 420 from printer equipment 103 to a computer apparatus 101.

[0046] Drawing 8 is the schematic diagram showing an example of a format of the notice packet of a network transmitted to a computer apparatus 101 from the network board 420 of the printer equipment 103 shown in drawing 1 .

[0047] In drawing, 800 is a notice packet of a network, 801 is the ID section, and the job ID 706 which the computer apparatus 101 gave to print data at arbitration is stored. 802 is the status section and the statuses, such as "job printing termination" "" during a job spool, job expansion, and job printing"" and "a job error", are stored in the printing condition, for example, the printing condition, of the specified job.

[0048] In addition, the condition that the print job receiving module of printer equipment 103 has received the job is shown "during a job spool." Moreover, it is shown "during job expansion" that the drawing module 602 of printer equipment 103 is developing print data to the bit map. Furthermore, it is shown "during job printing" that the developed bit map is transmitted to the LBP engine 411 with the printer engine driver module 601.

[0049] Moreover, "job printing termination" shows that the LBP engine 411 ended delivery and printing was completed. Furthermore, "a job error" shows that the error of a jam etc. has occurred with the LBP engine 411.

[0050] In addition, with this operation gestalt, the condition of job printing termination and a job error is notified during a job spool.

[0051] Drawing 9 is the schematic diagram showing an example of the packet format to which the computer apparatus 101 shown in drawing 1 supervises the printing condition of printer equipment 103.

[0052] In drawing, 901 is a printing condition demand packet and a computer apparatus 101 transmits it to printer equipment 103. The command with which the job ID 706 is stored in the ID

section 902, and the printing condition demand packet 901 shows a status demand to the command section 903 is stored.

[0053] 904 is a print job response packet and printer equipment 103 transmits it to a computer apparatus 101. 905 is the ID section and the job ID 706 is stored. As for the command section 906, the status response is stored. The job of the job ID applicable to a status response is described [in what kind of condition it is, and] by the detail (for example, pagination, a job category of error, etc. under current output).

[0054] In addition, using a monitoring port number, a computer apparatus 101 transmits the printing condition demand packet 901 to printer equipment 103, receives the print job response packet 904 from printer equipment 103, and is supervising the condition of printer equipment 103. Moreover, it consists of print job response packets 914 so that the printing condition of a job more detailed than the notice packet 800 of a network, for example, the pagination under present output, a job category of error, an error part when the condition of printer equipment 103, for example, a print jam, occurs, etc. can be acquired.

[0055] On the other hand, on the other hand, printer equipment 103 is transmitted to a target from printer equipment 103 at a computer apparatus 101 by functioning considering the condition of a print job as a port number for a notice port number notifying actively at a computer apparatus 101, and the notice packet 800 of a network has the composition of notifying three kinds, such as job printing termination and a job error, among the printing condition of a job, for example, a job spool.

[0056] Drawing 10 is the schematic diagram showing an example of the job management table which the job management module 603 of the printer equipment 103 shown in drawing 1 has managed.

[0057] In drawing, the job management module 603 has managed a job ID 1001, the communication link place protocol 1002, the notice place address 1003, the notice place port number 1004, and the job condition 1005 for every job ID.

[0058] Drawing 11 is the schematic diagram showing an example of the format of a notice packet which the printer equipment 103 shown in drawing 1 notifies to a network board 420.

[0059] In drawing, it functions as a flag for distinguishing whether 1101 is a notice flag and this packet is a notice packet or it is a print job response packet. In 1102, a notice place port number and 1105 show Job ID, and, as for the protocol type of a notice place, and 1103, 1106 shows a job printing condition, as for the protocol address of a notice place, and 1104.

[0060] in addition — the case where this packet of the notice module 505 (refer to drawing 5) of a job of a network board 420 is a notice packet from the notice flag 1101 in this operation gestalt — for example, the notice place protocol types 1102, such as TCP/IP, — for example, (192.1.2.155) — etc. — a job printing condition is transmitted to a computer apparatus 101 by the packet format as shown in the notice place of the notice place protocol address 1103 1104, for example, the notice place port number of 9045 grades, by drawing 8.

[0061] Hereafter, the characteristic configuration of this operation gestalt is explained with reference to drawing 1 R>1 grade.

[0062] A data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through the predetermined communication media (network 102) constituted as mentioned above. A conversion means to change the data from application into the print data based on predetermined print language (CPU201 loads ROM202 and the printer driver module 302 read from the memory resource of hard disk 208 grade on RAM203, and carries out transform processing), With said conversion means Said changed print data And the notice place of a packet based on said print data The included print job A transmitting means to transmit to said airline printer (CPU201 loads ROM202, the printing protocol module 307 read from the memory resource of hard disk 208 grade, a communication module 303, and network driver module 304 grade on RAM203) transmitting processing — carrying out — Analyze the packet which receives from said airline printer, and the condition of said airline printer is supervised. The contents of a monitor A monitor means to display on a display (monitor 104) (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) monitor processing — carrying out — after transmission of said print data The packet which

receives from said airline printer is analyzed. The initiation or termination of the house keeping of said airline printer by said monitor means The control means to control (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) Since it prepares for said data processor, the event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. communications processing — carrying out — Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, the present change of state of an airline printer can be easily checked by the display.

[0063] Moreover, a data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through predetermined communication media (network 102). An analysis means to analyze the print job received from said data processor (CPU401 loads the drawing module 602 read from ROM402 or the memory resource which is not illustrated to RAM403, and carries out analysis processing), A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired (secured on RAM203), The condition of said airline printer based on said print job A transmitting means to transmit the packet to notify to said data processor according to said notice address memorized by said storage means (load the job management module 603 which CPU401 read from ROM402 or the memory resource which is not illustrated to RAM403, and job management is performed) and the network protocol communication module 503 and network driver module 504 grade which CPU414 read from ROM415 or the memory resource which is not illustrated similarly — loading — transmitting processing — carrying out — After notifying to said packet by said transmitting means, So that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes may be notified to the sequential aforementioned data processor Since said airline printer is equipped with the control means (CPU414 loads the notice module 505 of a job read from ROM415 or the memory resource which is not illustrated, and carries out transmitting processing) which controls said transmitting means The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0064] Furthermore, a data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through predetermined communication media (network 102). A conversion means to change the data from application into the print data based on predetermined print language (CPU201 loads ROM202 and the printer driver module 302 read from the memory resource of hard disk 208 grade on RAM203, and carries out transform processing), With said conversion means Said changed print data And the notice place of a packet based on said print data The included print job A transmitting means to transmit to said airline printer (CPU201 loads ROM202, the printing protocol module 307 read from the memory resource of hard disk 208 grade, a communication module 303, and network driver module 304 grade on RAM203) transmitting processing — carrying out — Analyze the packet which receives from said airline printer, and the condition of said airline printer is supervised. The contents of a monitor A monitor means to display on a display (monitor 104) (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) monitor processing — carrying out — after transmission of said print data The packet which receives from said airline printer is analyzed. The initiation or termination of the house keeping of said airline printer by said monitor means The control means to control (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) communications processing — carrying out — it preparing for said data processor and with an analysis means (CPU401 loading the drawing module 602 read from ROM402 or the memory resource which is not illustrated to RAM403, and carrying out analysis processing) to analyze the print job received from said data processor A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis

means analyzes and is acquired (secured on RAM203), The condition of said airline printer based on said print job A transmitting means to transmit the packet to notify to said data processor according to said notice address memorized by said storage means (load the job management module 603 which CPU401 read from ROM402 or the memory resource which is not illustrated to RAM403, and job management is performed) and the network protocol communication module 503 and network driver module 504 grade which CPU414 read from ROM415 or the memory resource which is not illustrated similarly — loading — transmitting processing — carrying out — After notifying to said packet by said transmitting means, So that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes may be notified to the sequential aforementioned data processor Since said airline printer is equipped with the control means (CPU414 loads the notice module 505 of a job read from ROM415 or the memory resource which is not illustrated, and carries out transmitting processing) which controls said transmitting means The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0065] Moreover, since the condition of said said changing airline printer includes the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer is managed certainly. The environment which notifies certainly the abnormal condition of the airline printer generated in printing initiation of the print job which the airline printer received to the data processor which has transmitted the print job under present processing, printing termination, and a front print job can be improved free.

[0066] Drawing 12 is a flow chart which shows an example of the 1st data-processing procedure in the printing system which can apply the print control unit concerning this invention, and corresponds to processing of the printing protocol module 307 of the computer apparatus 101 shown in drawing 1 . In addition, (1) - (4) shows each step.

[0067] First, the printing protocol module 307 shown in drawing 3 will start the monitoring application module 305 for the monitoring of a print job, if a processing request is received from the printer driver module 302 (1). Then, protocol information is acquired from a communication module 303 (2). That is [it follows the format which showed this information to drawing 7], it stores in the notice place protocol type 703, the notice place protocol address 704, and the notice place port number 705 (it teaches), and job data 702 are created (3). In this way, printing is performed for the created printing job data using a communication module 303, and (4) and processing are ended.

[0068] Drawing 13 and drawing 14 are flow charts which show an example of the 2nd data-processing procedure in the printing system concerning this invention, and correspond to the procedure of the monitoring application module 305 of the computer apparatus 101 shown in drawing 1 . In addition, (1) - (14) shows each step.

[0069] First, the monitoring application module 305 is started from the printing protocol module 307, and supervises the condition of printer equipment 103. Therefore, if it starts, first, request to receipt will be published to a communication module 303, and it will become (1) and the data receiving waiting from a network 102 (2). And if data are received from a communication module 303, the monitoring application module 305 When the data judges whether it is reception from a notice port number (shown in the above-mentioned notice port number 705) and judges that it was reception from (3) and this notice port number The job printing condition 802 (refer to drawing 8) of the notice packet of a network which received from printer equipment 103 is analyzed. When the job printing condition 802 judges it judged whether it was under ["job spool"] *****, and "it was [job]" under (4) and spool, what the job was received for by printer equipment 103 is

displayed on a monitor 104 (11). And from the communication module 303 shown in drawing 3, the printing condition demand packet 901 which acquired a phase hand's (printer equipment 103) address, and was shown in drawing 9 to (12) and its address is generated, and it transmits to printer equipment 103 (9).

[0070] By this sequence, after acquiring the printer address which carries out monitoring, monitoring will be started to that printer equipment 103.

[0071] And the monitoring application module 305 after transmitting the printing condition demand packet 901 When it becomes the data receiving waiting from a communication module 303 again and data are received in a step (2), at a step (3) When it is judged that it was not reception from a notice port number When it judges whether it is reception from a monitoring port and it is judged that it is reception from (7) and a monitoring port, the monitoring application module 305 The condition of printer equipment 103 is displayed on a monitor 104 from the job status response 906, and (8) and in order to perform monitoring of printer equipment 103 again, the printing condition demand packet 901 is generated and it transmits to printer equipment 103 (9).

[0072] On the other hand, when data are received at a step (2) and it is judged that it received from the port which it is not from a notice port number at a step (3), either, and is not from a monitoring port at a step (7), either, the monitoring application module 305 cancels the packet which received, serves as (10) and receiving waiting, and returns to a step (1).

[0073] When the notice packet of a network is received from a notice port at a step (3), it judges whether the job printing condition 802 was "print job termination" and it is judged on the other hand that (5) and the job printing condition 802 were "print job termination", the monitoring application module 305 displays on a monitor 104 that job printing was completed, ends the monitoring of a print job, and ends (13) and a program.

[0074] When data are received at a step (3) and the notice packet of a network is received from a notice port on the other hand, The job printing condition 802 judges whether it is "a job error". (6), NO when becoming, and it becomes the waiting for return reception to a step (1) and it is judged that the job printing condition 802 was "a job error" at the step (6) The monitoring application module 305 displays on a monitor 104 what the job made the error in, transmits (14) printing condition demand packet 901, and serves as (9) and receiving waiting of a step (1).

[0075] With the above algorithm, indirectly, by acquiring the address of the printer equipment 103 which carries out monitoring from printer equipment 103, the monitoring application module 305 is started from the printing protocol module 307, monitoring of printer equipment 103 is performed, and with the notice of printing termination of printer equipment 103, ends monitoring and ends a program by printing demand of a user.

[0076] Therefore, the situation which a monitoring module resides permanently on RAM and presses a memory area is not produced after monitoring termination, either.

[0077] Drawing 15 is a flow chart which shows an example of the 3rd data-processing procedure in the printing system concerning this invention, and corresponds to the procedure of the job management module 603 of the printer equipment 103 shown in drawing 1. In addition, (1) - (7) shows each step.

[0078] First, printer equipment 103 receives a print job through a network board 420. When a print job is received, the job management module 603 is started. Starting of the job management module 603 registers the management data of a job into the job management table shown in drawing 10 (1). At this time, a job ID 1001, the notice place protocol 1002, the notice place address 1003, and the notice place port number 1004 are saved to the job management module 603 secured to RAM403.

[0079] And the job management module 603 is carried out while spooling the job condition 1005 of a job management table, and it generates a notice packet as shown in drawing 11. At this time, the notice place protocol type 1102 of "ON", the notice place protocol address 1103, the notice place port number 1104, and a job ID 1105 set the notice flag 1101 with reference to the job management table saved previously, and a job condition "under a job spool" is transmitted to a network board 420 (2).

[0080] The job management module 603 starts the monitor of the condition of printer equipment 103 from each module. Next, (3), moreover, when it judges whether the notice of an error was received from the printer engine driver module 601 or the drawing module 602 and it is judged that

the notice of (4) and an error was received The job management module 603 sends out a notice packet to a network board 420, and returns to (8) and a step (3) so that a job error may be notified to the job ID 1001 which corresponds from a job management table.

[0081] On the other hand, when it judges whether the notice of printing termination of a job was received from the printer engine driver module 601 when it was judged at a step (4) that the error notification is not received and it is judged that (5) and the notice of printing termination are not received, it returns to a step (3).

[0082] On the other hand, at a step (5), when it is judged that the error notification is received, to the job ID 1001 which corresponds from a job management table, the job management module 603 deletes the job ID which corresponds from the job management table which sends out the notice packet of printing termination to a network board 420, and is secured on RAM403 of printer equipment 103 after (6) and this sending out, and ends (7) and processing.

[0083] In addition, although not illustrated with this operation gestalt, when the job status demand packet 901 which requires the condition of a job from a network board 420 is received from a computer apparatus 101, the job management module 603 searches the corresponding job ID 1001, and answers a network board 420 in the job condition 1005. At this time, this shows that it is the packet of a response by clearing the notice flag 1101.

[0084] Printer equipment 103 is made into the event of monitoring actuation of the monitoring application module 305 of a computer apparatus 101 by notifying the condition of the job to the protocol and the address which were specified at the time of termination of a job at the time of the error of a job at the time of initiation of a job.

[0085] Drawing 16 is a flow chart which shows an example of the 4th data-processing procedure in the printing system concerning this invention, and corresponds to the procedure of the notice module 505 of a job of the network board 420 shown in drawing 4. In addition, (1) - (10) shows each step.

[0086] First, if the notice module 505 of a job is started to coincidence with powering on and the notice module 505 of a job starts, it will perform request to receipt to the network protocol communication module 503 and the printer I/F driver module 501, and will enable it to receive the packet from (1), and data and the printer equipment 103 from a network 102. It judges whether the notice module 505 of a job performed receiving waiting of a packet, and received the packet from the (2) printer I/F driver module 501. (3), When it is judged that the packet was received from the printer I/F driver module 501 When it judges that they were (4) and a notice packet, for whether it is a notice packet judging from the notice flag 1101 of a packet, the notice module 505 of a job The notice packet 800 of a network shown in drawing 8 is created, and (5), the notice place protocol type 1102 in a packet, the notice place protocol address 1103, and the notice packet 800 of a network this created to notice place port number 1104 are transmitted. (6), It returns to a step (1), and after transmission is completed, again, the notice module 505 of a job publishes request to receipt to the printer I/F driver module 501, and serves as (1) and receiving waiting (2).

[0087] On the other hand, at a step (4), when it is judged that it is not a notice packet, the print job response packet 904 is created, this print job response packet 904 is transmitted to a computer apparatus 101 through a network 102, and it returns to (7) and a step (1), and after transmission is completed, the notice module 505 of a job publishes request to receipt to the printer I/F driver module 501 again, and serves as (1) and receiving waiting (2).

[0088] When it is judged at a step (3) on the other hand that the packet is not received from the printer I/F driver module 501, namely, when it is judged that data were received from the network protocol communication module 503 When the notice module 505 of a job judges whether it is a status demand packet (printing condition demand packet 901) and it judges that they were (8) and a status demand packet A status demand packet is transmitted to printer equipment 103, it returns to (9) and a step (1), request to receipt is published to the network protocol communication module 503, and it becomes the waiting for reception.

[0089] On the other hand, at a step (8), when it is judged that they are packets other than a TETASU demand packet, the packet concerned is canceled, it returns to (10) and a step (1), request to receipt is published to the network protocol communication module 503, and it becomes the waiting for reception.

[0090] By the flow of the above processings, the notice module 505 of a job of a network board 420 transmits the notice packet 800 of a network from printer equipment 103 to the computer apparatus 101 of the network 102 point. Moreover, the printing condition demand packet 901 from a computer apparatus 101 is sent out to printer equipment 103, and the status from printer equipment 103 is transmitted to a computer apparatus 101.

[0091] Hereafter, the characteristic configuration of this operation gestalt is further explained with reference to drawing 12 - drawing 16 , etc.

[0092] The predetermined communication media constituted as mentioned above are minded, and it is a data processor (a computer apparatus 101 and an airline printer (printer equipment 103) are the house keeping approaches of the printing system in which packet communication is possible). Or it is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The data from application The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language, and said print data (notice place protocol address 704 shown in drawing 7) (step of drawing 12 (3)), The transmitting process which transmits the created this print job to said airline printer (step of drawing 12 (3)), The display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display (the step (8) of drawing 14 , (11), (13), (14)), The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer (step of drawing 13 (3)), The analysis process which analyzes the print job received from said data processor (are the last process of the step (1) of drawing 15 , and not shown), The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired (step of drawing 15 (1)), The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory (the step (5) of drawing 16 , (6)), Since it has the 2nd notice process (step of drawing 16 (7)) which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0093] The [2nd operation gestalt] With the above-mentioned 1st operation gestalt, although the communication link of printer equipment 103 and a computer apparatus 101 was performed through the network board 420, the printer equipment 103 which has the notice module of a job and network driver in a network board 420 may communicate with the direct computer apparatus 101.

[0094] Moreover, although printer equipment 103 had managed the job management table with this operation gestalt, this table is managed with a network board 420, and the same effectiveness can be raised even if it sends out a notice packet from a network board 420, when abnormalities are in printer equipment 103.

[0095] The printing system hereafter applied to this invention with reference to the memory map shown in drawing 17 explains the configuration of the data-processing program which can be read.

[0096] Drawing 17 is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[0097] In addition, although it does not illustrate especially, the information for which the information which manages the program group memorized by the storage, for example, version information, an implementer, etc. are memorized, and it depends on OS by the side of program read-out etc., for example, the icon which indicates the program by discernment, may be

memorized.

[0098] Furthermore, the data subordinate to various programs are also managed to the above-mentioned directory. Moreover, the program for installing various programs in a computer, the program thawed when the program to install is compressed may be memorized.

[0099] The function shown in drawing 12 in this operation gestalt, drawing 13, drawing 14 R> 4, drawing 15, and drawing 16 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when the information group which includes a program from an external storage is supplied by the output unit through storages, such as CD-ROM, a flash memory, and FD, or a network in that case.

[0100] As mentioned above, it cannot be overemphasized by supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and reading and performing the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that the purpose of this invention is attained.

[0101] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0102] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, EEPROM, etc. can be used, for example.

[0103] Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0104] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[0105]

[Effect of the Invention] According to the 1st invention which relates to this invention as explained above A data processor and an airline printer are the printing systems in which packet communication is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Since said data processor is equipped with the control means which analyzes the packet which receives from said airline printer after transmission of said print data, and controls the initiation or termination of the house keeping of said airline printer by said monitor means Even when the event which receives the packet from an airline printer is caught, initiation and termination of house keeping processing of an airline printer can be controlled and the condition monitor operator guidance of the airline printer by the conventional user is not made, the present change of state of an airline printer can be easily checked by the display.

[0106] An analysis means according to the 2nd invention for a data processor and an airline printer to be the printing systems in which packet communication is possible, and to analyze the print job received from said data processor through predetermined communication media, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, Since said airline printer is equipped with the control means which controls said transmitting means so that the response packet which shows

the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes may be notified to the sequential aforementioned data processor. The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0107] A conversion means by which according to the 3rd invention a data processor and an airline printer are the printing systems in which packet communication is possible, and change the data from application into the print data based on predetermined print language through predetermined communication media. A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer. A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display. Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data. An analysis means to analyze the print job received from said data processor. A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired. A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means. Since said airline printer is equipped with the control means which controls said transmitting means so that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes may be notified to the sequential aforementioned data processor. The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display. The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0108] According to invention of the 4th invention, the condition of said said changing airline printer. Since the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer are included. While being able to check the present change of state of an airline printer easily by the display. The destination which should notify the condition of an airline printer is managed certainly. The environment which notifies certainly the abnormal condition of said airline printer generated in printing initiation of the print job which the airline printer received to the data processor which has transmitted the print job under present processing, printing termination, and said print job can be improved free.

[0109] According to the 5th and 6th invention, a data processor and an airline printer are the house keeping approaches of the printing system in which packet communication is possible through predetermined communication media. Or it is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data. The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display. The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer. The analysis process which analyzes the print job received from said data processor. The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired. The

1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, Since it has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0110] Therefore, the effectiveness that the monitor processing to which the condition of an airline printer of having received the transmitted print job is displayed on a display is automatable etc. is done so, without transmitting to the data processor which manages the notice place which should notify the condition of the airline printer which changes in case the airline printer side which transmitted the print job from a user processes this print job, and manages a packet timely, and forcing it the operator guidance by the user.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the storage with which the data processor and the airline printer stored the house keeping approach of the printing system in which packet communication is possible, and a printing system, and the program which a computer can read through predetermined communication media.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] When printing in this kind of printing system conventionally with the printer equipment which minded the network, for example, with the computer apparatus, to the printer equipment assigned logically, a user transmits print data and is performing printing processing.

[0003] In order for a user to know what the condition of that printer equipment has become, or how the print data which the user performed are processed by the printer at this time, a user needs to specify the printer equipment assigned logically or physically.

[0004] That is, the user was performing monitoring of the status of printer equipment to which printer equipment on a network being conscious of whether printing processing is made.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] According to the 1st invention which relates to this invention as explained above A data processor and an airline printer are the printing systems in which packet communication is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Since said data processor is equipped with the control means which analyzes the packet which receives from said airline printer after transmission of said print data, and controls the initiation or termination of the house keeping of said airline printer by said monitor means Even when the event which receives the packet from an airline printer is caught, initiation and termination of house keeping processing of an airline printer can be controlled and the condition monitor operator guidance of the airline printer by the conventional user is not made, the present change of state of an airline printer can be easily checked by the display.

[0106] An analysis means according to the 2nd invention for a data processor and an airline printer to be the printing systems in which packet communication is possible, and to analyze the print job received from said data processor through predetermined communication media, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, Since said airline printer is equipped with the control means which controls said transmitting means so that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes may be notified to the sequential aforementioned data processor The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0107] A conversion means by which according to the 3rd invention a data processor and an airline printer are the printing systems in which packet communication is possible, and change the data from application into the print data based on predetermined print language through predetermined communication media, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data. An analysis means to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is

acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, Since said airline printer is equipped with the control means which controls said transmitting means so that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said transmitting means, and changes may be notified to the sequential aforementioned data processor The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0108] According to invention of the 4th invention, the condition of said said changing airline printer Since the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer are included While being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer is managed certainly. The environment which notifies certainly the abnormal condition of said airline printer generated in printing initiation of the print job which the airline printer received to the data processor which has transmitted the print job under present processing, printing termination, and said print job can be improved free.

[0109] According to the 5th and 6th invention, a data processor and an airline printer are the house keeping approaches of the printing system in which packet communication is possible through predetermined communication media. Or it is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, Since it has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0110] Therefore, the effectiveness that the monitor processing to which the condition of an airline printer of having received the transmitted print job is displayed on a display is automatable etc. is done so, without transmitting to the data processor which manages the notice place which should notify the condition of the airline printer which changes in case the airline printer side which transmitted the print job from a user processes this print job, and manages a packet timely, and

forcing it the operator guidance by the user.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, when carrying out monitoring of the status of the printer equipment with which the user performed printing, it must know which printer equipment on a network the printer equipment which the computer assigned logically is actually.

[0006] Moreover, the user needed to start the program for carrying out monitoring of the status of printer equipment, and there was a trouble that operability was bad.

[0007] This invention is what was made in order to cancel the above-mentioned trouble. The purpose of this invention By transmitting to the data processor which manages the notice place which should notify the condition of the airline printer which changes in case the airline printer side which transmitted the print job from a user processes this print job, and manages a packet timely Without forcing it the operator guidance by the user It is offering the storage which stored the house keeping approach of the printing system which can automate the monitor processing to which the condition of an airline printer of having received the transmitted print job is displayed on a display, and a printing system, and the program which a computer's can read.

[Translation done.]

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MEANS

[Means for Solving the Problem] The 1st invention concerning this invention is a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data.

[0009] An analysis means for the 2nd invention concerning this invention to be a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media, and to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, After notifying to said packet by said transmitting means, Said airline printer is equipped with the control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor.

[0010] The 3rd invention concerning this invention is a printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. A conversion means to change the data from application into the print data based on predetermined print language, A transmitting means to transmit the print job containing the notice place of a packet based on said print data changed by said conversion means, and said print data to said airline printer, A monitor means to analyze the packet which receives from said airline printer, to supervise the condition of said airline printer, and to display the contents of a monitor on a display, Said data processor is equipped with the control means which analyzes the packet which receives from said airline printer, and controls the initiation or termination of the house keeping of said airline printer by said monitor means after transmission of said print data. An analysis means to analyze the print job received from said data processor, A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired, A transmitting means to transmit the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address memorized by said storage means, After notifying to said packet by said transmitting means, Said airline printer is equipped with the control means which controls said transmitting means to notify the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor.

[0011] As for the 4th invention concerning this invention, the condition of said said changing airline printer includes the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer.

[0012] The 5th invention concerning this invention is the house keeping approach of the printing system in which the packet communication of a data processor and an airline printer is possible through predetermined communication media. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, It has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor after notifying to said packet by said 1st notice process.

[0013] The 6th invention concerning this invention is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language in the data from application, and said print data, The transmitting process which transmits the created this print job to said airline printer, and the display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display, The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer, The analysis process which analyzes the print job received from said data processor, The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired, The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory, It has the 2nd notice process which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes to the sequential aforementioned data processor after notifying to said packet by said 1st notice process.

[0014]

[Embodiment of the Invention]

The [1st operation gestalt] Drawing 1 is drawing explaining the printing structure of a system which shows the 1st operation gestalt of this invention.

[0015] In drawing, 101 is the computer apparatus of this operation gestalt, and consists of a body 105 with which the monitor 104, the hard disk, and CPU are stored, and a keyboard 106 which receives the key input from a user.

[0016] 103 is the airline printer (printer equipment) which is adapted in this operation gestalt, for example, in the case of a laser beam printer (following, LBP), corresponds. 102 is networks, such as Ethernet, and connects a computer apparatus 101 and printer equipment 103 possible [a communication link] with a predetermined protocol.

[0017] With this operation gestalt, a computer apparatus 101 transmits print data 107 to printer equipment 103 through a network 102. Moreover, printer equipment 103 will transmit the notice 108 of an event to a computer apparatus 101 through a network 102 according to the status of

printer equipment 103, if print data 107 are received. Furthermore, a computer apparatus 101 sends and receives printer equipment 103 and the monitoring packet 109, and supervises the status of printer equipment 103.

[0018] Drawing 2 is the block diagram showing the outline of the internal configuration of the computer apparatus 101 shown in drawing 1.

[0019] In drawing, 201 is CPU and starts data processing by the boot rise program memorized by ROM202. 203 is RAM, various data are temporarily stored as a work piece of CPU201, or a program is loaded. 208 is a hard disk, and various programs (an application program is included) are stored and it is accessed by CPU201 through the HD control section 205.

[0020] 206 is the I/O-hardware-control section and controls the I/O from monitors 104 and keyboards 106, such as CRT, FLC, and LCD, and a pointing device. 207 is a network I/F control section and controls the communication link with a network 102. Each [these] control section is accessed from CPU201 through the CPU bus 204.

[0021] Drawing 3 is the block diagram showing the outline of the program configuration of the computer apparatus 101 shown in drawing 1.

[0022] In drawing, 301 is a general-purpose application module and operates on a computer apparatus 101. 302 is a printer driver module and changes an application data into the print data of the printing data format of printer equipment 103 according to the demand from the general-purpose application module 301.

[0023] 307 is a printing protocol module and is a module which transmits the print data changed into the printing data format by the printer driver module 302 as print data to the printer equipment 101 on a network 102 through a communication module 303.

[0024] 304 is a network driver module and controls the network I/F control section 207 of drawing 2. 305 is a monitoring application module and supervises the condition of printer equipment 103, and the condition of printing. From the hard disk 208 of a computer apparatus 101, these modules are loaded on RAM203 by CPU201, and operate by it.

[0025] In addition, with this operation gestalt, the printer equipment 103 in which the above-mentioned monitoring application module 305 carries out monitoring is selected without a user's mediation, and it supervises so that the condition of printing may be mentioned later.

[0026] Drawing 4 is the block diagram showing the outline of the internal configuration of the printer equipment 103 shown in drawing 1.

[0027] In drawing, 401 is CPU, performs the various control programs memorized by ROM402 or the memory resource which is not illustrated, and controls the printer equipment 103 whole. 403 is RAM and functions mainly as work-piece memory of CPU401. 404 is a bus and each control section mentioned later is connected.

[0028] 405 is an engine control section and controls the LBP engine 411. 406 is the I/O-hardware-control section and controls the I/O from monitors 104 and keyboards 106, such as CRT, FLC, and LCD, and a pointing device. 407 is the data I/O-hardware-control section, performs input/output control of the data from the outside, and controls the extended I/F control section 408 and the parallel I/F control section 409. In addition, the extended I/F control section 408 has connected with a network board 420 through the add-in board bus 410.

[0029] A network board 420 consists of ROM415 in which the program which CPU414 and this CPU414 should perform is stored, RAM416 which functions as a work piece of this CPU414, the extended I/F control section 418 which controls I/O with the add-in board bus 410, a network I/F control section 419 which communicates with a network 102, and bus 417 grade which connects each above-mentioned device.

[0030] In addition, the data inputted from the network I/F control section 419 are controlled by CPU414, and are transmitted to printer equipment 103 through the extended I/F control section 418 as print data with various kinds of modules shown in drawing 5 mentioned later.

[0031] Drawing 5 is the schematic diagram showing the program configuration of the network board 420 shown in drawing 4, and has given the same sign to the same thing as drawing 4.

[0032] In drawing, 501 is a printer I/F driver module, controls the extended I/F control section 418 of drawing 4, and functions as a module which performs transmission and reception of printer equipment 103 and data. 502 is a printing protocol module and functions as a module which

supports the general-purpose printing protocol on a network 102.

[0033] 503 is a network protocol communication module and functions as a module which performs communications control of a network 102. 504 is a network driver module and is a routine which controls the network I/F control section 419 of drawing 4, sends out a packet or actually receives a packet on a network 102.

[0034] In addition, in the program of a network board 420, the printing protocol module 502 receives the print data from a computer apparatus 101 from a network 102 using the network protocol communication module 503 according to the printing communication procedure decided with the protocol, for example. And the received this print data are sent out to printer equipment 103 through the printer I/F driver module 501. 505 is a notice module of a job and transmits the job condition of printer equipment 103 to the computer apparatus 101 on a network 102.

[0035] Drawing 6 is the schematic diagram showing the program configuration of the printer equipment 103 shown in drawing 1.

[0036] In drawing, 605 is an extended I/F driver module and controls the extended I/F control section 408 which receives a job from the network board 420 of drawing 4. 606 is a parallel I/F driver module and controls the parallel I/F control section 409 of drawing 4. 604 is a print job receiving module and will receive a job from the extended I/F driver module 605 with this operation gestalt.

[0037] the module which manages as a job the data which 603 is a job management module and were received from the print job receiving module 604 — ** — it carries out, and it functions and this job is passed to the drawing module 602. And by the drawing module 602, print data are developed to a bit map.

[0038] 601 is a printer engine driver module, it functions as a module which controls the engine control section 405 which controls the LBP engine 411 of drawing 4, and the print data developed by the bit map are sent and printed by the LBP engine 411 with the printer engine driver module 601.

[0039] Moreover, the printer engine driver module 601 controls the engine control section 405 of drawing 4, supervises the condition of the LBP engine 411, and notifies a jam, printing termination, etc. to the job management module 603.

[0040] Drawing 7 is the schematic diagram showing a format of the printing job data transmitted to printer equipment 103 from the computer apparatus 101 shown in drawing 1.

[0041] In drawing, 701 is job-data length and the length of job data 702 is stored. Job data 702 consist of the notice protocol type 703, the notice place protocol address 704, the notice place port number 705, a job ID 706, print-data length 707, and print data 708.

[0042] In addition, the protocol type at the time of printer equipment 103 transmitting a notice packet is stored in the notice place protocol type 703. Since a computer apparatus 101 receives this notice packet from printer equipment 103 with this operation gestalt, the protocol type which the computer apparatus 101 is using is stored in this area.

[0043] Moreover, the address of the protocol at the time of printer equipment 103 transmitting a notice packet is stored in the notice place protocol address 704. Since a computer apparatus 101 receives this notice packet from printer equipment 103 with this operation gestalt, the protocol address of a computer apparatus 101 is stored in this area.

[0044] Furthermore, the port number of the protocol at the time of printer equipment 103 transmitting a notice packet is stored in the notice place port number 705. With this operation gestalt, the port number to which the monitoring application 305 of a computer apparatus 101 is carrying out waiting for a packet to the communication module 303 is stored in this area.

[0045] Moreover, a job ID 706 shows ID of the job which a computer apparatus 101 assigns to arbitration. Furthermore, the print-data length which shows the die length of the actual print data 708 was set to the print-data length 707, and the job management module 603 of printer equipment 103 considered that the data for this length were one job, and is managed. In addition, in this operation gestalt, it has composition which a network board 420 generates the notice packet of a network from a notice packet, and a call and this notice packet, and notifies the packet which shows the condition of the job notified to a network board 420 from printer equipment 103 to a computer apparatus 101.

[0046] Drawing 8 is the schematic diagram showing an example of a format of the notice packet of a network transmitted to a computer apparatus 101 from the network board 420 of the printer equipment 103 shown in drawing 1.

[0047] In drawing, 800 is a notice packet of a network, 801 is the ID section, and the job ID 706 which the computer apparatus 101 gave to print data at arbitration is stored. 802 is the status section and the statuses, such as "job printing termination" "" during a job spool, job expansion, and job printing "" and "a job error", are stored in the printing condition, for example, the printing condition, of the specified job.

[0048] In addition, the condition that the print job receiving module of printer equipment 103 has received the job is shown "during a job spool." Moreover, it is shown "during job expansion" that the drawing module 602 of printer equipment 103 is developing print data to the bit map. Furthermore, it is shown "during job printing" that the developed bit map is transmitted to the LBP engine 411 with the printer engine driver module 601.

[0049] Moreover, "job printing termination" shows that the LBP engine 411 ended delivery and printing was completed. Furthermore, "a job error" shows that the error of a jam etc. has occurred with the LBP engine 411.

[0050] In addition, with this operation gestalt, the condition of job printing termination and a job error is notified during a job spool.

[0051] Drawing 9 is the schematic diagram showing an example of the packet format to which the computer apparatus 101 shown in drawing 1 supervises the printing condition of printer equipment 103.

[0052] In drawing, 901 is a printing condition demand packet and a computer apparatus 101 transmits it to printer equipment 103. The command with which the job ID 706 is stored in the ID section 902, and the printing condition demand packet 901 shows a status demand to the command section 903 is stored.

[0053] 904 is a print job response packet and printer equipment 103 transmits it to a computer apparatus 101. 905 is the ID section and the job ID 706 is stored. As for the command section 906, the status response is stored. The job of the job ID applicable to a status response is described [in what kind of condition it is, and] by the detail (for example, pagination, a job category of error, etc. under current output).

[0054] In addition, using a monitoring port number, a computer apparatus 101 transmits the printing condition demand packet 901 to printer equipment 103, receives the print job response packet 904 from printer equipment 103, and is supervising the condition of printer equipment 103. Moreover, it consists of print job response packets 914 so that the printing condition of a job more detailed than the notice packet 800 of a network, for example, the pagination under present output, a job category of error, an error part when the condition of printer equipment 103, for example, a print jam, occurs, etc. can be acquired.

[0055] On the other hand, on the other hand, printer equipment 103 is transmitted to a target from printer equipment 103 at a computer apparatus 101 by functioning considering the condition of a print job as a port number for a notice port number notifying actively at a computer apparatus 101, and the notice packet 800 of a network has the composition of notifying three kinds, such as job printing termination and a job error, among the printing condition of a job, for example, a job spool.

[0056] Drawing 10 is the schematic diagram showing an example of the job management table which the job management module 603 of the printer equipment 103 shown in drawing 1 has managed.

[0057] In drawing, the job management module 603 has managed a job ID 1001, the communication link place protocol 1002, the notice place address 1003, the notice place port number 1004, and the job condition 1005 for every job ID.

[0058] Drawing 11 is the schematic diagram showing an example of the format of a notice packet which the printer equipment 103 shown in drawing 1 notifies to a network board 420.

[0059] In drawing, it functions as a flag for distinguishing whether 1101 is a notice flag and this packet is a notice packet or it is a print job response packet. In 1102, a notice place port number and 1105 show Job ID, and, as for the protocol type of a notice place, and 1103, 1106 shows a job printing condition, as for the protocol address of a notice place, and 1104.

[0060] in addition — the case where this packet of the notice module 505 (refer to drawing 5) of a job of a network board 420 is a notice packet from the notice flag 1101 in this operation gestalt — for example, the notice place protocol types 1102, such as TCP/IP, — for example, (192.1.2.155) — etc. — a job printing condition is transmitted to a computer apparatus 101 by the packet format as shown in the notice place of the notice place protocol address 1103 1104, for example, the notice place port number of 9045 grades, by drawing 8.

[0061] Hereafter, the characteristic configuration of this operation gestalt is explained with reference to drawing 1 R>1 grade.

[0062] A data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through the predetermined communication media (network 102) constituted as mentioned above. A conversion means to change the data from application into the print data based on predetermined print language (CPU201 loads ROM202 and the printer driver module 302 read from the memory resource of hard disk 208 grade on RAM203, and carries out transform processing). With said conversion means Said changed print data And the notice place of a packet based on said print data The included print job A transmitting means to transmit to said airline printer (CPU201 loads ROM202, the printing protocol module 307 read from the memory resource of hard disk 208 grade, a communication module 303, and network driver module 304 grade on RAM203) transmitting processing — carrying out — Analyze the packet which receives from said airline printer, and the condition of said airline printer is supervised. The contents of a monitor A monitor means to display on a display (monitor 104) (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) monitor processing — carrying out — after transmission of said print data The packet which receives from said airline printer is analyzed. The initiation or termination of the house keeping of said airline printer by said monitor means The control means to control (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) Since it prepares for said data processor, the event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. communications processing — carrying out — Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, the present change of state of an airline printer can be easily checked by the display.

[0063] Moreover, a data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through predetermined communication media (network 102). An analysis means to analyze the print job received from said data processor (CPU401 loads the drawing module 602 read from ROM402 or the memory resource which is not illustrated to RAM403, and carries out analysis processing). A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired (secured on RAM203). The condition of said airline printer based on said print job A transmitting means to transmit the packet to notify to said data processor according to said notice address memorized by said storage means (load the job management module 603 which CPU401 read from ROM402 or the memory resource which is not illustrated to RAM403, and job management is performed) and the network protocol communication module 503 and network driver module 504 grade which CPU414 read from ROM415 or the memory resource which is not illustrated similarly — loading — transmitting processing — carrying out — After notifying to said packet by said transmitting means, So that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes may be notified to the sequential aforementioned data processor Since said airline printer is equipped with the control means (CPU414 loads the notice module 505 of a job read from ROM415 or the memory resource which is not illustrated, and carries out transmitting processing) which controls said transmitting means The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0064] Furthermore, a data processor (computer apparatus 101) and an airline printer (printer equipment 103) are the printing systems in which packet communication is possible through predetermined communication media (network 102). A conversion means to change the data from application into the print data based on predetermined print language (CPU201 loads ROM202 and the printer driver module 302 read from the memory resource of hard disk 208 grade on RAM203, and carries out transform processing). With said conversion means Said changed print data And the notice place of a packet based on said print data The included print job A transmitting means to transmit to said airline printer (CPU201 loads ROM202, the printing protocol module 307 read from the memory resource of hard disk 208 grade, a communication module 303, and network driver module 304 grade on RAM203) transmitting processing — carrying out — Analyze the packet which receives from said airline printer, and the condition of said airline printer is supervised. The contents of a monitor A monitor means to display on a display (monitor 104) (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) monitor processing — carrying out — after transmission of said print data The packet which receives from said airline printer is analyzed. The initiation or termination of the house keeping of said airline printer by said monitor means The control means to control (CPU201 loads ROM202, the monitoring application 305 read from the memory resource of hard disk 208 grade, a communication module 303, and the network driver module 304 on RAM203) communications processing — carrying out — it preparing for said data processor and with an analysis means (CPU401 loading the drawing module 602 read from ROM402 or the memory resource which is not illustrated to RAM403, and carrying out analysis processing) to analyze the print job received from said data processor. A storage means to memorize the notice address which notifies the condition of said airline printer that said analysis means analyzes and is acquired (secured on RAM203). The condition of said airline printer based on said print job A transmitting means to transmit the packet to notify to said data processor according to said notice address memorized by said storage means (load the job management module 603 which CPU401 read from ROM402 or the memory resource which is not illustrated to RAM403, and job management is performed) and the network protocol communication module 503 and network driver module 504 grade which CPU414 read from ROM415 or the memory resource which is not illustrated similarly — loading — transmitting processing — carrying out — After notifying to said packet by said transmitting means, So that the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor, and changes may be notified to the sequential aforementioned data processor Since said airline printer is equipped with the control means (CPU414 loads the notice module 505 of a job read from ROM415 or the memory resource which is not illustrated, and carries out transmitting processing) which controls said transmitting means The event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0065] Moreover, since the condition of said said changing airline printer includes the abnormalities of the printing initiation based on said print job, printing termination, and said airline printer, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer is managed certainly. The environment which notifies certainly the abnormal condition of the airline printer generated in printing initiation of the print job which the airline printer received to the data processor which has transmitted the print job under present processing, printing termination, and a front print job can be improved free.

[0066] Drawing 12 is a flow chart which shows an example of the 1st data-processing procedure in the printing system which can apply the print control unit concerning this invention, and corresponds to processing of the printing protocol module 307 of the computer apparatus 101

shown in drawing 1 . In addition, (1) - (4) shows each step.

[0067] First, the printing protocol module 307 shown in drawing 3 will start the monitoring application module 305 for the monitoring of a print job, if a processing request is received from the printer driver module 302 (1). Then, protocol information is acquired from a communication module 303 (2). That is [it follows the format which showed this information to drawing 7], it stores in the notice place protocol type 703, the notice place protocol address 704, and the notice place port number 705 (it teaches), and job data 702 are created (3). In this way, printing is performed for the created printing job data using a communication module 303, and (4) and processing are ended.

[0068] Drawing 13 and drawing 14 are flow charts which show an example of the 2nd data-processing procedure in the printing system concerning this invention, and correspond to the procedure of the monitoring application module 305 of the computer apparatus 101 shown in drawing 1 . In addition, (1) - (14) shows each step.

[0069] First, the monitoring application module 305 is started from the printing protocol module 307, and supervises the condition of printer equipment 103. Therefore, if it starts, first, request to receipt will be published to a communication module 303, and it will become (1) and the data receiving waiting from a network 102 (2). And if data are received from a communication module 303, the monitoring application module 305 When the data judges whether it is reception from a notice port number (shown in the above-mentioned notice port number 705) and judges that it was reception from (3) and this notice port number The job printing condition 802 (refer to drawing 8) of the notice packet of a network which received from printer equipment 103 is analyzed. When the job printing condition 802 judges it judged whether it was under ["job spool"] *****, and "it was [job]" under (4) and spool, what the job was received for by printer equipment 103 is displayed on a monitor 104 (11). And from the communication module 303 shown in drawing 3 , the printing condition demand packet 901 which acquired a phase hand's (printer equipment 103) address, and was shown in drawing 9 to (12) and its address is generated, and it transmits to printer equipment 103 (9).

[0070] By this sequence, after acquiring the printer address which carries out monitoring, monitoring will be started to that printer equipment 103.

[0071] And the monitoring application module 305 after transmitting the printing condition demand packet 901 When it becomes the data receiving waiting from a communication module 303 again and data are received in a step (2), at a step (3) When it is judged that it was not reception from a notice port number When it judges whether it is reception from a monitoring port and it is judged that it is reception from (7) and a monitoring port, the monitoring application module 305 The condition of printer equipment 103 is displayed on a monitor 104 from the job status response 906, and (8) and in order to perform monitoring of printer equipment 103 again, the printing condition demand packet 901 is generated and it transmits to printer equipment 103 (9).

[0072] On the other hand, when data are received at a step (2) and it is judged that it received from the port which it is not from a notice port number at a step (3), either, and is not from a monitoring port at a step (7), either, the monitoring application module 305 cancels the packet which received, serves as (10) and receiving waiting, and returns to a step (1).

[0073] When the notice packet of a network is received from a notice port at a step (3), it judges whether the job printing condition 802 was "print job termination" and it is judged on the other hand that (5) and the job printing condition 802 were "print job termination", the monitoring application module 305 displays on a monitor 104 that job printing was completed, ends the monitoring of a print job, and ends (13) and a program.

[0074] When data are received at a step (3) and the notice packet of a network is received from a notice port on the other hand, The job printing condition 802 judges whether it is "a job error". (6), NO when becoming, and it becomes the waiting for return reception to a step (1) and it is judged that the job printing condition 802 was "a job error" at the step (6) The monitoring application module 305 displays on a monitor 104 what the job made the error in, transmits (14) printing condition demand packet 901, and serves as (9) and receiving waiting of a step (1).

[0075] With the above algorithm, indirectly, by acquiring the address of the printer equipment 103 which carries out monitoring from printer equipment 103, the monitoring application module 305 is

started from the printing protocol module 307, monitoring of printer equipment 103 is performed, and with the notice of printing termination of printer equipment 103, ends monitoring and ends a program by printing demand of a user.

[0076] Therefore, the situation which a monitoring module resides permanently on RAM and presses a memory area is not produced after monitoring termination, either.

[0077] Drawing 15 is a flow chart which shows an example of the 3rd data-processing procedure in the printing system concerning this invention, and corresponds to the procedure of the job management module 603 of the printer equipment 103 shown in drawing 1. In addition, (1) - (7) shows each step.

[0078] First, printer equipment 103 receives a print job through a network board 420. When a print job is received, the job management module 603 is started. Starting of the job management module 603 registers the management data of a job into the job management table shown in drawing 10 (1). At this time, a job ID 1001, the notice place protocol 1002, the notice place address 1003, and the notice place port number 1004 are saved to the job management module 603 secured to RAM403.

[0079] And the job management module 603 is carried out while spooling the job condition 1005 of a job management table, and it generates a notice packet as shown in drawing 11. At this time, the notice place protocol type 1102 of "ON", the notice place protocol address 1103, the notice place port number 1104, and a job ID 1105 set the notice flag 1101 with reference to the job management table saved previously, and a job condition "under a job spool" is transmitted to a network board 420 (2).

[0080] The job management module 603 starts the monitor of the condition of printer equipment 103 from each module. Next, (3), moreover, when it judges whether the notice of an error was received from the printer engine driver module 601 or the drawing module 602 and it is judged that the notice of (4) and an error was received The job management module 603 sends out a notice packet to a network board 420, and returns to (8) and a step (3) so that a job error may be notified to the job ID 1001 which corresponds from a job management table.

[0081] On the other hand, when it judges whether the notice of printing termination of a job was received from the printer engine driver module 601 when it was judged at a step (4) that the error notification is not received and it is judged that (5) and the notice of printing termination are not received, it returns to a step (3).

[0082] On the other hand, at a step (5), when it is judged that the error notification is received, to the job ID 1001 which corresponds from a job management table, the job management module 603 deletes the job ID which corresponds from the job management table which sends out the notice packet of printing termination to a network board 420, and is secured on RAM403 of printer equipment 103 after (6) and this sending out, and ends (7) and processing.

[0083] In addition, although not illustrated with this operation gestalt, when the job status demand packet 901 which requires the condition of a job from a network board 420 is received from a computer apparatus 101, the job management module 603 searches the corresponding job ID 1001, and answers a network board 420 in the job condition 1005. At this time, this shows that it is the packet of a response by clearing the notice flag 1101.

[0084] Printer equipment 103 is made into the event of monitoring actuation of the monitoring application module 305 of a computer apparatus 101 by notifying the condition of the job to the protocol and the address which were specified at the time of termination of a job at the time of the error of a job at the time of initiation of a job.

[0085] Drawing 16 is a flow chart which shows an example of the 4th data-processing procedure in the printing system concerning this invention, and corresponds to the procedure of the notice module 505 of a job of the network board 420 shown in drawing 4. In addition, (1) - (10) shows each step.

[0086] First, if the notice module 505 of a job is started to coincidence with powering on and the notice module 505 of a job starts, it will perform request to receipt to the network protocol communication module 503 and the printer I/F driver module 501, and will enable it to receive the packet from (1), and data and the printer equipment 103 from a network 102. It judges whether the notice module 505 of a job performed receiving waiting of a packet, and received the packet from the (2) printer I/F driver module 501. (3), When it is judged that the packet was received from the

printer I/F driver module 501 When it judges that they were (4) and a notice packet, for whether it is a notice packet judging from the notice flag 1101 of a packet, the notice module 505 of a job The notice packet 800 of a network shown in drawing 8 is created, and (5), the notice place protocol type 1102 in a packet, the notice place protocol address 1103, and the notice packet 800 of a network this created to notice place port number 1104 are transmitted. (6), It returns to a step (1), and after transmission is completed, again, the notice module 505 of a job publishes request to receipt to the printer I/F driver module 501, and serves as (1) and receiving waiting (2).

[0087] On the other hand, at a step (4), when it is judged that it is not a notice packet, the print job response packet 904 is created, this print job response packet 904 is transmitted to a computer apparatus 101 through a network 102, and it returns to (7) and a step (1), and after transmission is completed, the notice module 505 of a job publishes request to receipt to the printer I/F driver module 501 again, and serves as (1) and receiving waiting (2).

[0088] When it is judged at a step (3) on the other hand that the packet is not received from the printer I/F driver module 501, namely, when it is judged that data were received from the network protocol communication module 503 When the notice module 505 of a job judges whether it is a status demand packet (printing condition demand packet 901) and it judges that they were (8) and a status demand packet A status demand packet is transmitted to printer equipment 103, it returns to (9) and a step (1), request to receipt is published to the network protocol communication module 503, and it becomes the waiting for reception.

[0089] On the other hand, at a step (8), when it is judged that they are packets other than a TETASU demand packet, the packet concerned is canceled, it returns to (10) and a step (1), request to receipt is published to the network protocol communication module 503, and it becomes the waiting for reception.

[0090] By the flow of the above processings, the notice module 505 of a job of a network board 420 transmits the notice packet 800 of a network from printer equipment 103 to the computer apparatus 101 of the network 102 point. Moreover, the printing condition demand packet 901 from a computer apparatus 101 is sent out to printer equipment 103, and the status from printer equipment 103 is transmitted to a computer apparatus 101.

[0091] Hereafter, the characteristic configuration of this operation gestalt is further explained with reference to drawing 1212 - drawing 16 , etc.

[0092] The predetermined communication media constituted as mentioned above are minded, and it is a data processor (a computer apparatus 101 and an airline printer (printer equipment 103) are the house keeping approaches of the printing system in which packet communication is possible). Or it is the storage which stored the program which the computer by which a data processor and an airline printer control the house keeping of the printing system in which packet communication is possible through predetermined communication media can read. The data from application The creation process which creates the print job containing the notice place of a packet based on said print data changed into the print data based on predetermined print language, and said print data (notice place protocol address 704 shown in drawing 7) (step of drawing 12 (3)), The transmitting process which transmits the created this print job to said airline printer (step of drawing 12 (3)), The display process which analyzes the packet which receives from said airline printer, supervises the condition of said airline printer, and displays the contents of a monitor on a display (the step (8) of drawing 14 , (11), (13), (14)), The monitor process which analyzes the packet which receives from said airline printer after transmission of said print data, and starts or ends the house keeping of said airline printer (step of drawing 13 (3)), The analysis process which analyzes the print job received from said data processor (are the last process of the step (1) of drawing 15 , and not shown), The registration process which registers into memory the notice address which notifies the condition of said airline printer that said analysis process analyzes and is acquired (step of drawing 15 (1)), The 1st notice process which notifies the packet which notifies the condition of said airline printer based on said print job to said data processor according to said notice address registered into said memory (the step (5) of drawing 16 , (6)), Since it has the 2nd notice process (step of drawing 16 (7)) which notifies the response packet which shows the condition of said airline printer which analyzes the packet which receives from said data processor after notifying to said packet by said 1st notice process, and changes to the sequential aforementioned data processor The

event which receives the packet from an airline printer is caught, and initiation and termination of house keeping processing of an airline printer can be controlled. Even when the condition monitor operator guidance of the airline printer by the conventional user is not made, while being able to check the present change of state of an airline printer easily by the display The destination which should notify the condition of an airline printer can be managed certainly, and the environment which notifies the condition of an airline printer to the data processor which has transmitted the print job under present processing certainly can be improved free.

[0093] The [2nd operation gestalt] With the above-mentioned 1st operation gestalt, although the communication link of printer equipment 103 and a computer apparatus 101 was performed through the network board 420, the printer equipment 103 which has the notice module of a job and network driver in a network board 420 may communicate with the direct computer apparatus 101.

[0094] Moreover, although printer equipment 103 had managed the job management table with this operation gestalt, this table is managed with a network board 420, and the same effectiveness can be raised even if it sends out a notice packet from a network board 420, when abnormalities are in printer equipment 103.

[0095] The printing system hereafter applied to this invention with reference to the memory map shown in drawing 17 explains the configuration of the data-processing program which can be read.

[0096] Drawing 17 is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[0097] In addition, although it does not illustrate especially, the information for which the information which manages the program group memorized by the storage, for example, version information, an implementer, etc. are memorized, and it depends on OS by the side of program read-out etc., for example, the icon which indicates the program by discernment, may be memorized.

[0098] Furthermore, the data subordinate to various programs are also managed to the above-mentioned directory. Moreover, the program for installing various programs in a computer, the program thawed when the program to install is compressed may be memorized.

[0099] The function shown in drawing 12 in this operation gestalt, drawing 13, drawing 14 R> 4, drawing 15, and drawing 16 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when the information group which includes a program from an external storage is supplied by the output unit through storages, such as CD-ROM, a flash memory, and FD, or a network in that case.

[0100] As mentioned above, it cannot be overemphasized by supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and reading and performing the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that the purpose of this invention is attained.

[0101] In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.

[0102] As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, EEPROM, etc. can be used, for example.

[0103] Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0104] Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing explaining the printing structure of a system which shows the 1st operation gestalt of this invention.

[Drawing 2] It is the block diagram showing the outline of the internal configuration of the computer apparatus shown in drawing 1.

[Drawing 3] It is the block diagram showing the outline of the program configuration of the computer apparatus shown in drawing 1.

[Drawing 4] It is the block diagram showing the outline of the internal configuration of the printer equipment shown in drawing 1.

[Drawing 5] It is the schematic diagram showing the program configuration of the network board shown in drawing 4.

[Drawing 6] It is the schematic diagram showing the program configuration of the printer equipment shown in drawing 1.

[Drawing 7] It is the schematic diagram showing a format of the printing job data transmitted to printer equipment from the computer apparatus shown in drawing 1.

[Drawing 8] It is the schematic diagram showing an example of a format of the notice packet of a network transmitted to a computer apparatus from the network board of the printer equipment shown in drawing 1.

[Drawing 9] The computer apparatus shown in drawing 1 is the schematic diagram showing an example of the packet format which supervises the printing condition of printer equipment.

[Drawing 10] It is the schematic diagram showing a job management table example which the job management module of the printer equipment shown in drawing 1 has managed.

[Drawing 11] The printer equipment shown in drawing 1 is the schematic diagram showing an example of the format of a notice packet notified to a network board.

[Drawing 12] It is the flow chart which shows an example of the 1st data-processing procedure in the printing system which can apply the print control unit concerning this invention.

[Drawing 13] It is the flow chart which shows an example of the 2nd data-processing procedure in the printing system concerning this invention.

[Drawing 14] It is the flow chart which shows an example of the 2nd data-processing procedure in the printing system concerning this invention.

[Drawing 15] It is the flow chart which shows an example of the 3rd data-processing procedure in the printing system concerning this invention.

[Drawing 16] It is the flow chart which shows an example of the 4th data-processing procedure in the printing system concerning this invention.

[Drawing 17] It is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read by the printing system concerning this invention.

[Description of Notations]

101 Computer Apparatus

102 Network

103 Printer Equipment

104 Monitor

201 CPU
202 ROM
203 RAM
207 Network I/F Control Section

[Translation done.]

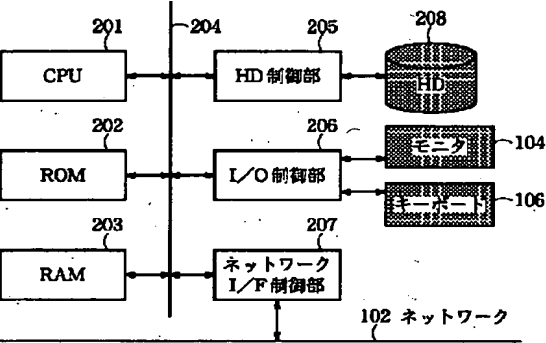
* NOTICES *

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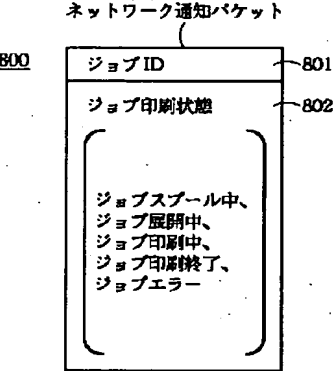
- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 2]



[Drawing 8]

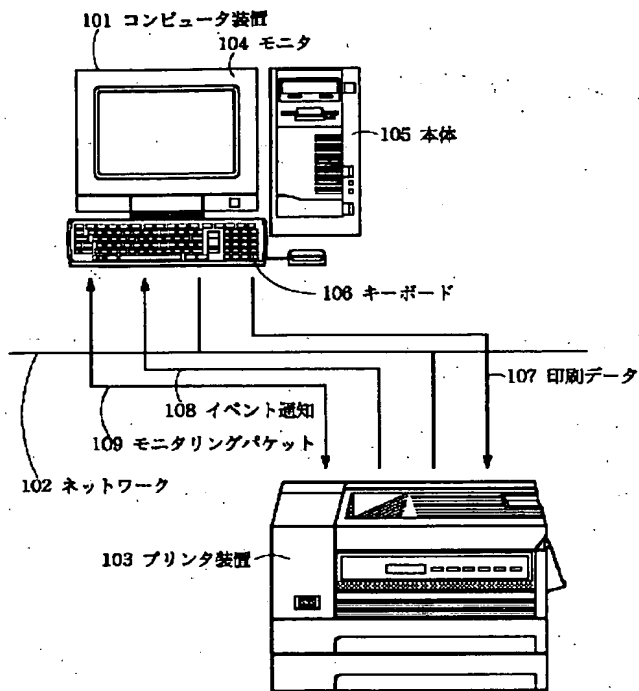


[Drawing 11]

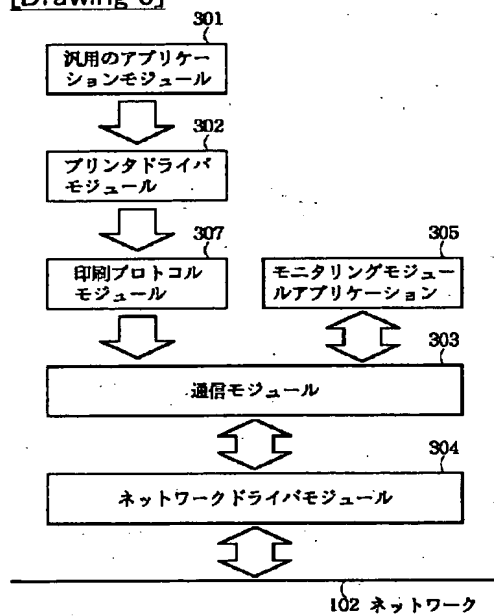
通知パケットのフォーマット

通知フラグ	1101
通知先プロトコルタイプ	1102
通知先プロトコルアドレス	1103
通知先ポート番号	1104
ジョブID	1105
ジョブ印刷状態	1106

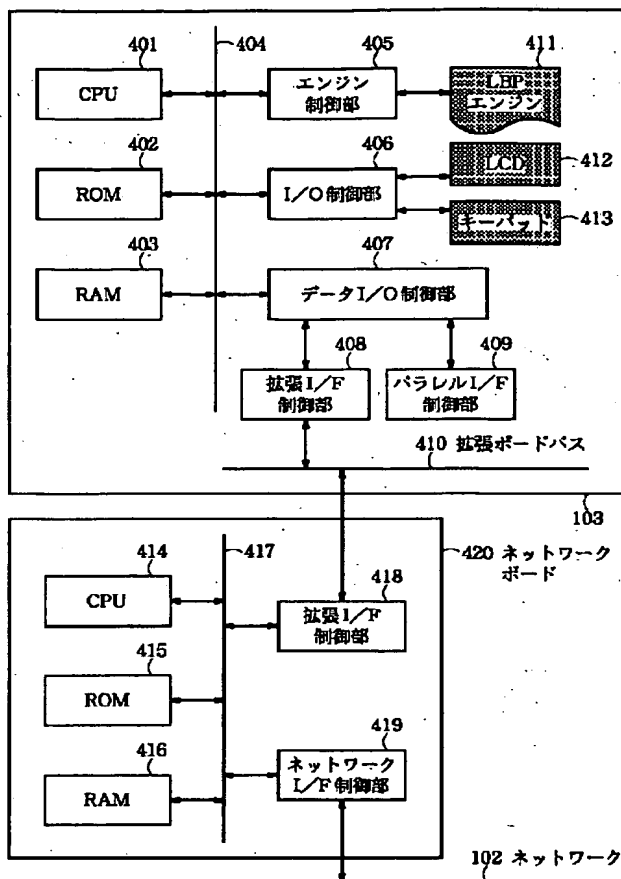
[Drawing 1]



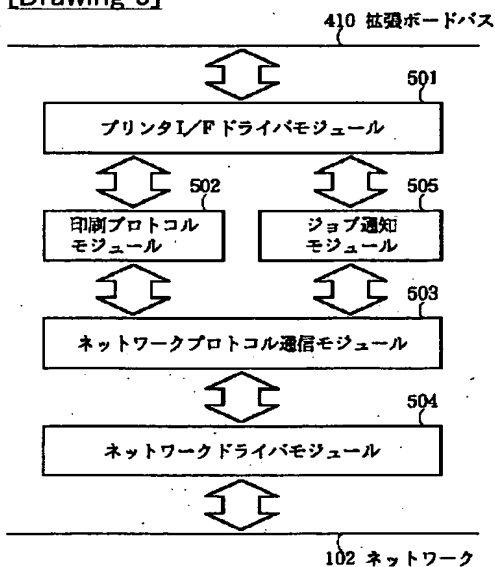
[Drawing 3]



[Drawing 4]



[Drawing 5]

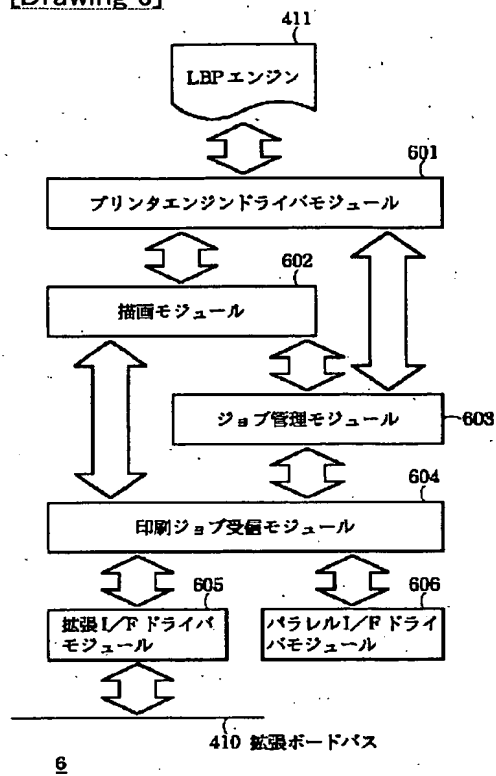


[Drawing 10]

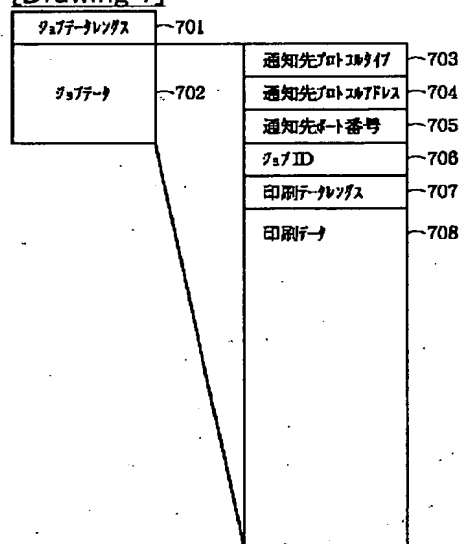
1001	ジョブID	1234	2233	3124
1002	通知先プロトコル	TCP/IP	TCP/IP	TCP/IP
1003	通知先アドレス	192.1.2.155	192.1.2.168	192.1.2.121
1004	通知先ポート番号	9045	9045	9045
1005	ジョブ状態	スプール中	印刷中	展開中

ジョブ管理テーブル

[Drawing 6]

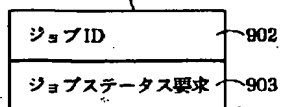


[Drawing 7]

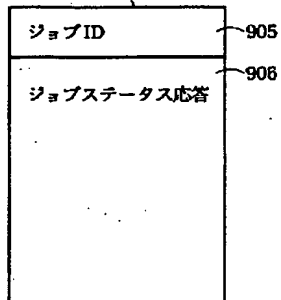


[Drawing 9]

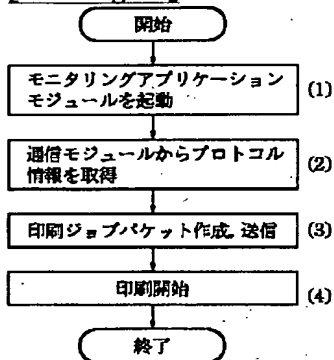
901 印刷状態要求パケット



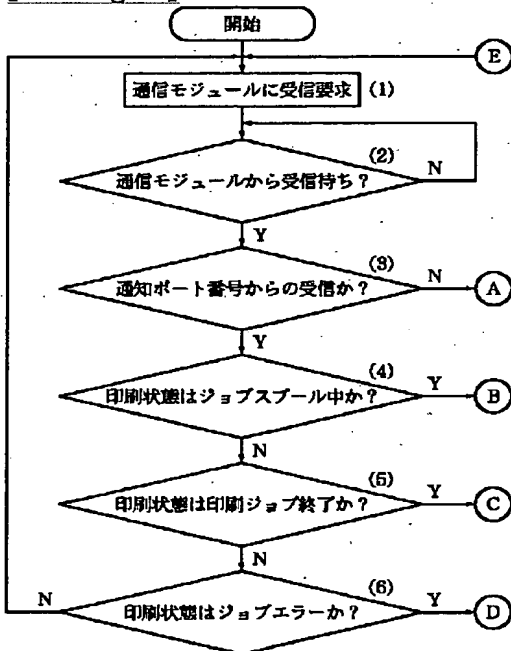
904 印刷ジョブ応答パケット



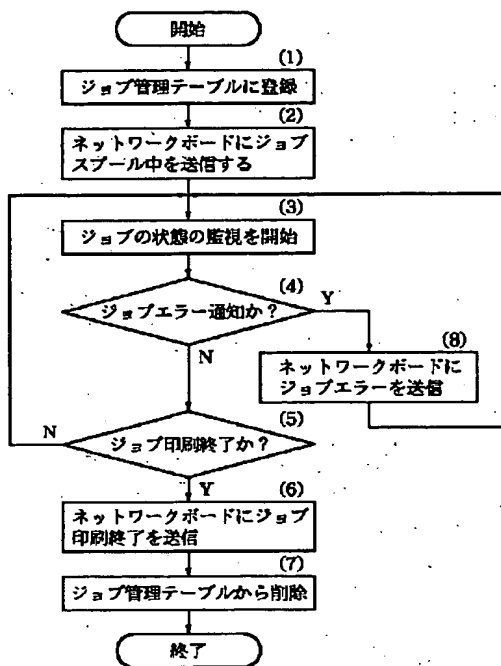
[Drawing 12]



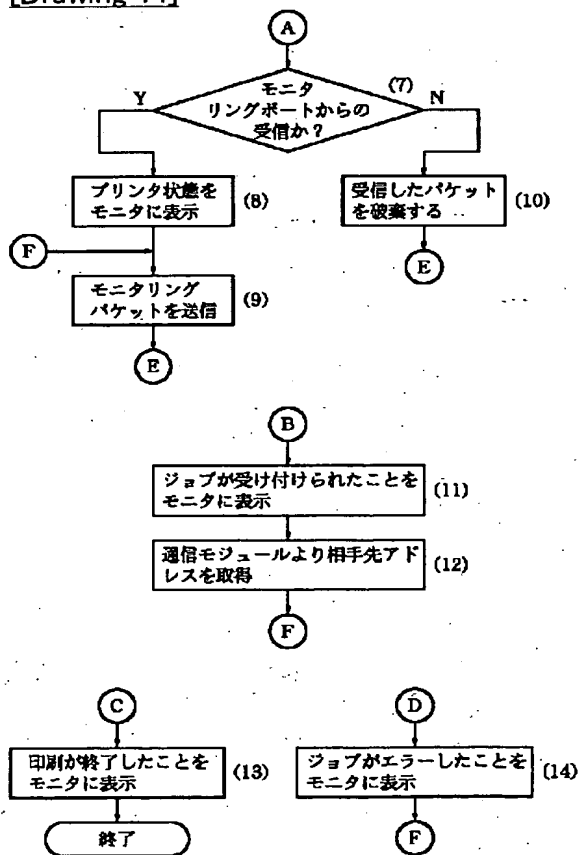
[Drawing 13]



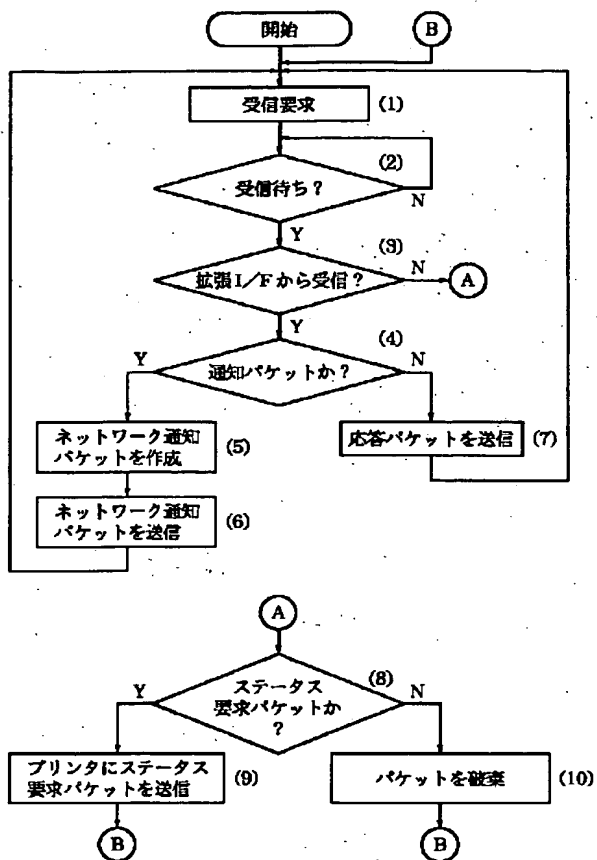
[Drawing 15]



[Drawing 14]



[Drawing 16]



[Drawing 17]

FD/CD-ROM等の記憶媒体

ディレクトリ情報
第1のデータ処理プログラム 図12に示すフローチャートのステップに対応するプログラムコード群
第2のデータ処理プログラム 図13,14に示すフローチャートのステップに対応するプログラムコード群
第3のデータ処理プログラム 図15に示すフローチャートのステップに対応するプログラムコード群
第4のデータ処理プログラム 図16に示すフローチャートのステップに対応するプログラムコード群

記憶媒体のメモリマップ

[Translation done.]

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(71) 出願人

000001007

キヤノン株式会社

東京都大田区下丸子3丁目30番2号

(72) 発明者

落合 将人

東京都大田区下丸子3丁目30番2号 キヤ

ノン株式会社内

(74) 代理人

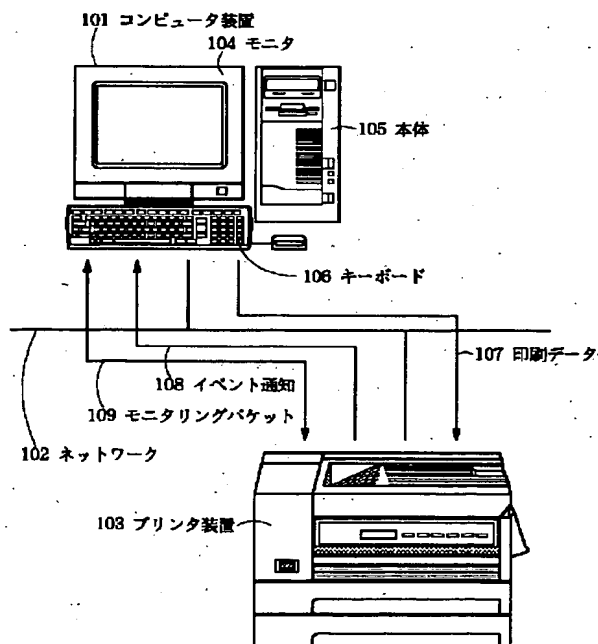
弁理士 小林 将高

(54) 【発明の名称】 印刷システムおよび印刷システムの状態監視方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体

(57) 【要約】

【課題】 転送した印刷ジョブを受信している印刷装置の状態を表示部に表示させる監視処理を自動化することである。

【解決手段】 印刷データの送信後、プリンタ装置103から受信するパケットを解析してコンピュータ装置101のCPUによるプリンタ装置103の状態監視の開始または終了を制御しつつ、プリンタ装置103から受信するパケットを解析してプリンタ装置103の状態を監視して監視内容をモニタ104に表示する構成を特徴とする。



【特許請求の範囲】

【請求項1】 所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段と、を前記データ処理装置に備えることを特徴とする印刷システム。

【請求項2】 所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段と、を前記印刷装置に備えることを特徴とする印刷システム。

【請求項3】 所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段とを前記データ処理装置に備え、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、

前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段と、を前記印刷装置に備えることを特徴とする印刷システム。

【請求項4】 前記変化する前記印刷装置の状態は、前記印刷ジョブに基づく印刷開始、印刷終了、前記印刷装置の異常を含むことを特徴とする請求項2または3記載の印刷システム。

【請求項5】 所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視方法であって、

アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを作成する作成工程と、

該作成された印刷ジョブを前記印刷装置に送信する送信工程と、

前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程と、

前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程と、

前記データ処理装置から受信される印刷ジョブを解析する解析工程と、

前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程と、前記第1の通知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程と、を有することを特徴とする印刷システムの状態監視方法。

【請求項6】 所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視を制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、

アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを作成する作成工程と、

該作成された印刷ジョブを前記印刷装置に送信する送信工程と、
 前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程と、
 前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程と、
 前記データ処理装置から受信される印刷ジョブを解析する解析工程と、
 前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程と、
 前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程と、
 前記第1の通知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程と、を有することを特徴とするコンピュータが読み出し可能なプログラムを格納した記憶媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムおよび印刷システムの状態監視方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体に関するものである。

【0002】

【従来の技術】 従来、この種の印刷システムにおいては、例えばネットワークを介したプリンタ装置で印刷する場合、ユーザはコンピュータ装置によって、論理的に割り当てられたプリンタ装置に対して、印刷データを転送して印刷処理を実行している。

【0003】 このとき、そのプリンタ装置の状態がどのようになっているか、ユーザが実行した印刷データが、プリンタでどのように処理されているかをユーザが知るためには、ユーザは論理的、又は物理的に割り当てられたプリンタ装置を指定する必要がある。

【0004】 すなわち、ユーザはネットワーク上のどのプリンタ装置に印刷処理がなされているかを意識して、プリンタ装置のステータスのモニタリングを行っていた。

【0005】

【発明が解決しようとする課題】 しかしながら、ユーザが印刷を実行したプリンタ装置のステータスをモニタリングする場合、コンピュータが論理的に割り当てたプリンタ装置が実際にネットワーク上のどのプリンタ装置であるかを知らなければならない。

【0006】 また、プリンタ装置のステータスをモニタ

リングするためのプログラムをユーザが起動する必要がある操作性が悪いという問題点があった。

【0007】 本発明は、上記の問題点を解消するためになされたもので、本発明の目的は、ユーザからの印刷ジョブを転送した印刷装置側が該印刷ジョブを処理する際に変化する印刷装置の状態を通知すべき通知先を管理して、適時パケットを管理するデータ処理装置に転送することにより、ユーザによる操作指示を強いることなく、転送した印刷ジョブを受信している印刷装置の状態を表示部に表示させる監視処理を自動化することができる印刷システムおよび印刷システムの状態監視方法およびコンピュータが読み出し可能なプログラムを格納した記憶媒体を提供することである。

【0008】

【課題を解決するための手段】 本発明に係る第1の発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段とを前記データ処理装置に備えるものである。

【0009】 本発明に係る第2の発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段とを前記印刷装置に備えるものである。

【0010】 本発明に係る第3の発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記

印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段とを前記データ処理装置に備え、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段とを前記印刷装置に備えるものである。

【0011】本発明に係る第4の発明は、前記変化する前記印刷装置の状態は、前記印刷ジョブに基づく印刷開始、印刷終了、前記印刷装置の異常を含むものである。

【0012】本発明に係る第5の発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視方法であって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを作成する作成工程と、該作成された印刷ジョブを前記印刷装置に送信する送信工程と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程と、前記データ処理装置から受信される印刷ジョブを解析する解析工程と、前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程と、前記第1の通知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程とを有するものである。

【0013】本発明に係る第6の発明は、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視を制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを作成する作成工程と、該作成された印刷ジョブを

前記印刷装置に送信する送信工程と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程と、前記データ処理装置から受信される印刷ジョブを解析する解析工程と、前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程と、前記第1の通知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程とを有するものである。

【0014】

【発明の実施の形態】

【第1実施形態】図1は、本発明の第1実施形態を示す印刷システムの構成を説明する図である。

【0015】図において、101は本実施形態のコンピュータ装置であり、モニタ104、ハードディスクやCPUが格納されている本体105、ユーザからのキー入力を受けるキーボード106からなる。

【0016】103は本実施形態を適応する印刷装置（プリンタ装置）で、例えばレーザビームプリンタ（以下、LBP）の場合に対応する。102は例えばイーサネット等のネットワークで、コンピュータ装置101とプリンタ装置103とを所定のプロトコルで通信可能に接続する。

【0017】本実施形態では、コンピュータ装置101は印刷データ107をネットワーク102を介してプリンタ装置103に送信する。また、プリンタ装置103は印刷データ107を受信すると、プリンタ装置103のステータスに応じてコンピュータ装置101にネットワーク102を介してイベント通知108を送信する。さらに、コンピュータ装置101は、プリンタ装置103とモニタリングパケット109を送受し、プリンタ装置103のステータスを監視する。

【0018】図2は、図1に示したコンピュータ装置101の内部構成の概略を示すブロック図である。

【0019】図において、201はCPUで、ROM202に記憶されたブートアッププログラムによりデータ処理を起動する。203はRAMで、CPU201のワークとして種々のデータを一時的に格納したり、プログラムがロードされる。208はハードディスクで、種々のプログラム（アプリケーションプログラムを含む）が格納されており、HD制御部205を介してCPU201によりアクセスされる。

【0020】206はI/O制御部で、CRT、FL

C、LCD等のモニタ104やキーボード106、ポインティングデバイスからの入出力を制御する。207はネットワークI/F制御部で、ネットワーク102との通信を制御する。これら各制御部はCPUバス204を介してCPU201からアクセスされる。

【0021】図3は、図1に示したコンピュータ装置101のプログラム構成の概略を示すブロック図である。

【0022】図において、301は汎用のアプリケーションモジュールで、コンピュータ装置101上で動作する。302はプリンタドライバモジュールで、汎用のアプリケーションモジュール301からの要求に応じて、アプリケーションデータをプリンタ装置103の印刷データフォーマットのプリントデータに変換する。

【0023】307は印刷プロトコルモジュールで、プリンタドライバモジュール302により印刷データフォーマットに変換されたプリントデータを通信モジュール303を介してネットワーク102上のプリンタ装置101に印刷データとして送信するモジュールである。

【0024】304はネットワークドライバモジュールで、図2のネットワークI/F制御部207を制御する。305はモニタリングアプリケーションモジュールで、プリンタ装置103の状態や、印刷の状態を監視する。これらのモジュールはコンピュータ装置101のハードディスク208からCPU201によって、RAM203上にロードされて動作する。

【0025】なお、本実施形態では、上記モニタリングアプリケーションモジュール305がモニタリングするプリンタ装置103をユーザの介在なしに選定し、印刷の状態を後述するように監視する。

【0026】図4は、図1に示したプリンタ装置103の内部構成の概略を示すブロック図である。

【0027】図において、401はCPUで、ROM402あるいは図示しないメモリ資源に記憶される各種制御プログラムを実行してプリンタ装置103全体を制御する。403はRAMで、主としてCPU401のワークメモリとして機能する。404はバスで、後述する各制御部が接続されている。

【0028】405はエンジン制御部で、LBPエンジン411を制御する。406はI/O制御部で、CRT、FLC、LCD等のモニタ104やキーボード106、ポインティングデバイスからの入出力を制御する。407はデータI/O制御部で、外部からのデータの入出力制御を行い、拡張I/F制御部408やパラレルI/F制御部409を制御する。なお、拡張I/F制御部408は拡張ボードバス410を介してネットワークボード420と接続している。

【0029】ネットワークボード420は、CPU414、該CPU414が実行すべきプログラムが格納されているROM415、該CPU414のワークとして機能するRAM416、拡張ボードバス410とのI/O

を制御する拡張I/F制御部418、ネットワーク102と通信を行うネットワークI/F制御部419、上記各デバイスを接続するバス417等からなる。

【0030】なお、ネットワークI/F制御部419から入力されたデータはCPU414に制御され、後述する図5に示す各種のモジュールにより印刷データとして、拡張I/F制御部418を介してプリンタ装置103に送信される。

【0031】図5は、図4に示したネットワークボード420のプログラム構成を示す概略図であり、図4と同一のものには同一の符号を付してある。

【0032】図において、501はプリンタI/Fドライバモジュールで、図4の拡張I/F制御部418を制御して、プリンタ装置103とデータの送受信を行うモジュールとして機能する。502は印刷プロトコルモジュールで、ネットワーク102上の汎用印刷プロトコルをサポートするモジュールとして機能する。

【0033】503はネットワークプロトコル通信モジュールで、ネットワーク102の通信制御を行うモジュールとして機能する。504はネットワークドライバモジュールで、図4のネットワークI/F制御部419を制御し、実際にネットワーク102上にパケットを送出したり、パケットを受信するルーチンである。

【0034】なお、ネットワークボード420のプログラムにおいて、印刷プロトコルモジュール502は、プロトコルで決められた印刷通信手順に従って、ネットワークプロトコル通信モジュール503を用いて、ネットワーク102から、例えばコンピュータ装置101からの印刷データを受信する。そして、該受信した印刷データは、プリンタI/Fドライバモジュール501を介してプリンタ装置103に送出される。505はジョブ通知モジュールで、プリンタ装置103のジョブ状態をネットワーク102上のコンピュータ装置101に送信する。

【0035】図6は、図1に示したプリンタ装置103のプログラム構成を示す概略図である。

【0036】図において、605は拡張I/Fドライバモジュールで、図4のネットワークボード420からジョブを受信する拡張I/F制御部408を制御する。606はパラレルI/Fドライバモジュールで、図4のパラレルI/F制御部409を制御する。604は印刷ジョブ受信モジュールで、本実施形態では拡張I/Fドライバモジュール605からジョブを受信することになる。

【0037】603はジョブ管理モジュールで、印刷ジョブ受信モジュール604から受信したデータをジョブとして管理するモジュールとして機能し、該ジョブは描画モジュール602に渡される。そして、描画モジュール602では印刷データをビットマップに展開する。

【0038】601はプリンタエンジンドライバモジュ

ールで、図4のLBPエンジン411を制御するエンジン制御部405を制御するモジュールとして機能し、ビットマップに展開された印刷データはプリンタエンジンドライバモジュール601によって、LBPエンジン411に送られて印刷される。

【0039】また、プリンタエンジンドライバモジュール601は、図4のエンジン制御部405を制御して、LBPエンジン411の状態を監視し、ジャムや印字終了などをジョブ管理モジュール603に通知する。

【0040】図7は、図1に示したコンピュータ装置101からプリンタ装置103に送信される印刷ジョブデータのフォーマットを示す概略図である。

【0041】図において、701はジョブデータレングスで、ジョブデータ702のレングスが格納されている。ジョブデータ702は、通知プロトコルタイプ703、通知先プロトコルアドレス704、通知先ポート番号705、ジョブID706、印刷データレングス707、印刷データ708からなる。

【0042】なお、通知先プロトコルタイプ703には、プリンタ装置103が通知パケットを送信する際のプロトコルタイプが格納されている。本実施形態ではコンピュータ装置101がこの通知パケットをプリンタ装置103から受信するので、コンピュータ装置101が使用しているプロトコルタイプをこのエリアに格納する。

【0043】また、通知先プロトコルアドレス704には、プリンタ装置103が通知パケットを送信する際のプロトコルのアドレスが格納されている。本実施形態ではコンピュータ装置101がこの通知パケットをプリンタ装置103から受信するので、コンピュータ装置101のプロトコルアドレスをこのエリアに格納する。

【0044】さらに、通知先ポート番号705には、プリンタ装置103が通知パケットを送信する際のプロトコルのポート番号が格納されている。本実施形態ではコンピュータ装置101のモニタリングアプリケーション305が通信モジュール303に対してパケット待ちをしているポート番号をこのエリアに格納する。

【0045】また、ジョブID706は、コンピュータ装置101が任意に割り振るジョブのIDを示す。さらに、印刷データレングス707には実際の印刷データ708の長さを示す印刷データレングスが設定され、プリンタ装置103のジョブ管理モジュール603はこのレングス分のデータを一つのジョブとみなして管理している。なお、本実施形態において、プリンタ装置103からネットワークボード420に通知されるジョブの状態を示すパケットを通知パケットと呼び、この通知パケットからネットワークボード420はネットワーク通知パケットを生成してコンピュータ装置101に通知する構成となっている。

【0046】図8は、図1に示したプリンタ装置103

のネットワークボード420からコンピュータ装置101に送信されるネットワーク通知パケットのフォーマットの一例を示す概略図である。

【0047】図において、800はネットワーク通知パケット、801はID部で、コンピュータ装置101が印刷データに任意につけたジョブID706が格納されている。802はステータス部で、指定されたジョブの印刷状態、例えば印刷状態には「ジョブスプール中」、「ジョブ展開中」、「ジョブ印刷中」、「ジョブ印刷終了」、「ジョブエラー」などのステータスが格納される。

【0048】なお、「ジョブスプール中」とは、プリンタ装置103の印刷ジョブ受信モジュールがジョブを受信している状態を示す。また、「ジョブ展開中」とは、プリンタ装置103の描画モジュール602が印刷データをビットマップに展開していることを示す。さらに、「ジョブ印刷中」とは、展開されたビットマップがプリンタエンジンドライバモジュール601によって、LBPエンジン411に送信されていることを示す。

【0049】また、「ジョブ印刷終了」とは、LBPエンジン411が排紙を終了し、印刷が終了したことを示す。さらに、「ジョブエラー」とはLBPエンジン411でジャムなどのエラーが発生していることを示す。

【0050】なお、本実施形態では、ジョブスプール中、ジョブ印刷終了、ジョブエラーの状態を通知する。

【0051】図9は、図1に示したコンピュータ装置101がプリンタ装置103の印刷状態を監視するパケットフォーマットの一例を示す概略図である。

【0052】図において、901は印刷状態要求パケットで、コンピュータ装置101がプリンタ装置103に送信する。印刷状態要求パケット901は、ID部902にはジョブID706が格納されており、コマンド部903にはステータス要求を示すコマンドが格納されている。

【0053】904は印刷ジョブ応答パケットで、プリンタ装置103がコンピュータ装置101に送信する。905はID部で、ジョブID706が格納されている。コマンド部906はステータス応答が格納されている。ステータス応答には、該当するジョブIDのジョブがどのような状態にあるのか詳細に記述される（例えば現在出力中のページ数や、ジョブエラーの種類等）。

【0054】なお、コンピュータ装置101は、モニタリングポート番号を用いて、印刷状態要求パケット901をプリンタ装置103に送信し、プリンタ装置103から印刷ジョブ応答パケット904を受信して、プリンタ装置103の状態を監視している。また、印刷ジョブ応答パケット914では、ネットワーク通知パケット800よりも詳細なジョブの印刷状態、例えば現在出力中のページ数、ジョブエラーの種類や、プリンタ装置103の状態、例えばプリントジャムが発生した場合のエラ

一個所等を得ることが出来るように構成されている。

【0055】一方、通知ポート番号は、プリンタ装置103が能動的にコンピュータ装置101に印刷ジョブの状態を通知するためのポート番号として機能し、ネットワーク通知パケット800は、一方的にプリンタ装置103からコンピュータ装置101に送信され、ジョブの印刷状態、例えばジョブスプール中、ジョブ印刷終了、ジョブエラー等の3種類を通知する構成となっている。

【0056】図10は、図1に示したプリンタ装置103のジョブ管理モジュール603が管理しているジョブ管理テーブルの一例を示す概略図である。

【0057】図において、ジョブ管理モジュール603は各ジョブIDごとに、ジョブID1001、通信先プロトコル1002、通知先アドレス1003、通知先ポート番号1004、ジョブ状態1005を管理している。

【0058】図11は、図1に示したプリンタ装置103がネットワークボード420に通知する通知パケットのフォーマットの一例を示す概略図である。

【0059】図において、1101は通知フラグで、このパケットが通知パケットであるか、印刷ジョブ応答パケットであるかを判別するためのフラグとして機能する。1102は通知先のプロトコルタイプ、1103は通知先のプロトコルアドレス、1104は通知先ポート番号、1105はジョブID、1106はジョブ印刷状態を示す。

【0060】なお、本実施形態において、ネットワークボード420のジョブ通知モジュール505（図5参照）は、通知フラグ1101からこのパケットが通知パケットであった場合には、例えばTCP/IP等の通知先プロトコルタイプ1102、例えば（192. 1. 2. 155）等の通知先プロトコルアドレス1103、例えば9045等の通知先ポート番号1104の通知先に図8で示したようなパケットフォーマットでジョブ印刷状態をコンピュータ装置101に対して送信する。

【0061】以下、本実施形態の特徴的構成について図1等を参照して説明する。

【0062】上記のように構成された所定の通信媒体（ネットワーク102）を介してデータ処理装置（コンピュータ装置101）と印刷装置（プリンタ装置103）とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したプリンタドライバモジュール302をRAM203上にロードして変換処理する）と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出した印

刷プロトコルモジュール307、通信モジュール303、ネットワークドライバモジュール304等をRAM203上にロードして送信処理する）と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部（モニタ104）に表示する監視手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したモニタリングアプリケーション305、通信モジュール303、ネットワークドライバモジュール304をRAM203上にロードして監視処理する）と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したモニタリングアプリケーション305、通信モジュール303、ネットワークドライバモジュール304をRAM203上にロードして通信処理する）とを前記データ処理装置に備えるので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができる。

【0063】また、所定の通信媒体（ネットワーク102）を介してデータ処理装置（コンピュータ装置101）と印刷装置（プリンタ装置103）とがパケット通信可能な印刷システムであって、前記データ処理装置から受信される印刷ジョブを解析する解析手段（CPU401がROM402または図示しないメモリ資源から読み出した描画モジュール602をRAM403にロードして解析処理する）と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段（RAM203上に確保される）と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段（CPU401がROM402または図示しないメモリ資源から読み出したジョブ管理モジュール603をRAM403にロードしてジョブ管理を行い、かつ、同様に、CPU414がROM415または図示しないメモリ資源から読み出したネットワークプロトコル通信モジュール503、ネットワークドライバモジュール504等をロードして送信処理する）と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段（CPU414がROM415または図示しないメモリ資源から読み出したジョブ通知モジュール505をロードして送信処理する）とを前記印刷装置に備えるので、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転

送してきたデータ処理装置に印刷装置の状態を確実に通知する環境を自在に整備することができる。

【0064】さらに、所定の通信媒体（ネットワーク102）を介してデータ処理装置（コンピュータ装置101）と印刷装置（プリンタ装置103）とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したプリンタドライバモジュール302をRAM203上にロードして変換処理する）と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出した印刷プロトコルモジュール307、通信モジュール303、ネットワークドライバモジュール304等をRAM203上にロードして送信処理する）と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部（モニタ104）に表示する監視手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したモニタリングアプリケーション305、通信モジュール303、ネットワークドライバモジュール304をRAM203上にロードして監視処理する）と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段（CPU201がROM202、ハードディスク208等のメモリ資源から読み出したモニタリングアプリケーション305、通信モジュール303、ネットワークドライバモジュール304をRAM203上にロードして通信処理する）とを前記データ処理装置に備え、前記データ処理装置から受信される印刷ジョブを解析する解析手段（CPU401がROM402または図示しないメモリ資源から読み出した描画モジュール602をRAM403にロードして解析処理する）と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段（RAM203上に確保される）と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段（CPU401がROM402または図示しないメモリ資源から読み出したジョブ管理モジュール603をRAM403にロードしてジョブ管理を行い、かつ、同様に、CPU414がROM415または図示しないメモリ資源から読み出したネットワークプロトコル通信モジュール503、ネットワークドライバモジュール504等をロードして送信処理する）と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示

す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段（CPU414がROM415または図示しないメモリ資源から読み出したジョブ通知モジュール505をロードして送信処理する）とを前記印刷装置に備えるので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置の状態を確実に通知する環境を自在に整備することができる。

【0065】また、前記変化する前記印刷装置の状態は、前記印刷ジョブに基づく印刷開始、印刷終了、前記印刷装置の異常を含むので印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置が受信した印刷ジョブの印刷開始、印刷終了、前記印刷ジョブ中に発生する印刷装置の異常状態を確実に通知する環境を自在に整備することができる。

【0066】図12は、本発明に係る印刷制御装置を適用可能な印刷システムにおける第1のデータ処理手順の一例を示すフローチャートであり、図1に示したコンピュータ装置101の印刷プロトコルモジュール307の処理に対応する。なお、(1)～(4)は各ステップを示す。

【0067】まず、図3に示した印刷プロトコルモジュール307は、プリンタドライバモジュール302から処理依頼を受けると、印刷ジョブのモニタリングのため、モニタリングアプリケーションモジュール305を起動する(1)。続いて、通信モジュール303からプロトコル情報を取得する(2)。この情報を、図7に示したフォーマットに従う、すなわち、通知先プロトコルタイプ703、通知先プロトコルアドレス704、通知先ポート番号705に格納（仕込む）し、ジョブデータ702を作成する(3)。こうして作成された印刷ジョブデータを通信モジュール303を用いて、印刷を実行して(4)、処理を終了する。

【0068】図13、図14は、本発明に係る印刷システムにおける第2のデータ処理手順の一例を示すフローチャートであり、図1に示したコンピュータ装置101のモニタリングアプリケーションモジュール305の処理手順に対応する。なお、(1)～(14)は各ステップを示す。

【0069】まず、モニタリングアプリケーションモジュール305は印刷プロトコルモジュール307から起動され、プリンタ装置103の状態を監視する。そのため、起動すると、まず、通信モジュール303に受信要

求を発行し(1)、ネットワーク102からのデータ受信待ちとなる(2)。そして、モニタリングアプリケーションモジュール305は通信モジュール303からデータを受信すると、そのデータが通知ポート番号(上記通知ポート番号705に示す)からの受信かどうかを判断し(3)、該通知ポート番号からの受信であったと判断した場合には、プリンタ装置103から受信したネットワーク通知パケットのジョブ印刷状態802(図8参照)の解析を行い、ジョブ印刷状態802が「ジョブスプール」中かどうかを判断し(4)、「ジョブスプール」中であったと判断した場合には、ジョブがプリンタ装置103に受け付けられたことをモニタ104に表示する(11)。そして、図3に示した通信モジュール303から、相手先(プリンタ装置103)のアドレスを取得して(12)、そのアドレスに対して図9に示した印刷状態要求パケット901を生成し、プリンタ装置103に対して送信する(9)。

【0070】このシーケンスにより、モニタリングするプリンタアドレスを取得した後、そのプリンタ装置103に対して、モニタリングを開始することになる。

【0071】そして、印刷状態要求パケット901を送信後、モニタリングアプリケーションモジュール305は、ステップ(2)において、再び通信モジュール303からのデータ受信待ちとなり、データを受信したとき、ステップ(3)で、通知ポート番号からの受信でなかったと判断した場合には、モニタリングアプリケーションモジュール305はモニタリングポートからの受信かどうかを判断し(7)、モニタリングポートからの受信であると判断した場合には、ジョブステータス応答906からプリンタ装置103の状態をモニタ104に表示して(8)、再びプリンタ装置103のモニタリングを行うために、印刷状態要求パケット901を生成し、プリンタ装置103に送信する(9)。

【0072】一方、ステップ(2)でデータを受信したとき、ステップ(3)で通知ポート番号からでもなく、ステップ(7)で、モニタリングポートからでもないポートから受信したと判断した場合には、モニタリングアプリケーションモジュール305は受信したパケットを破棄して(10)、受信待ちとなりステップ(1)へ戻る。

【0073】一方、ステップ(3)で、通知ポートからネットワーク通知パケットを受信したとき、そのジョブ印刷状態802が「印刷ジョブ終了」であったかどうかを判断し(5)、ジョブ印刷状態802が「印刷ジョブ終了」であったと判断した場合には、モニタリングアプリケーションモジュール305は、ジョブ印刷が終了したことをモニタ104に表示して、印刷ジョブのモニタリングを終了し(13)、プログラムを終了する。

【0074】一方、ステップ(3)でデータを受信したとき、通知ポートからネットワーク通知パケットを受信

したとき、そのジョブ印刷状態802が、「ジョブエラー」かどうかを判断し(6)、NOならばステップ

(1)へ戻り受信待ちとなり、ステップ(6)でジョブ印刷状態802が、「ジョブエラー」であったと判断した場合には、モニタリングアプリケーションモジュール305はジョブがエラーしたことをモニタ104に表示して(14)、印刷状態要求パケット901を送信して(9)、ステップ(1)の受信待ちとなる。

【0075】以上のアルゴリズムにより、モニタリングアプリケーションモジュール305は、ユーザの印刷要求によって、間接的に印刷プロトコルモジュール307から起動され、モニタリングするプリンタ装置103のアドレスをプリンタ装置103から取得することによって、プリンタ装置103のモニタリングを行い、プリンタ装置103の印字終了通知とともに、モニタリングを終了しプログラムを終了する。

【0076】従って、モニタリング終了後、RAM上にモニタリングモジュールが常駐してメモリ領域を圧迫してしまう事態も生じない。

【0077】図15は、本発明に係る印刷システムにおける第3のデータ処理手順の一例を示すフローチャートであり、図1に示したプリンタ装置103のジョブ管理モジュール603の処理手順に対応する。なお、(1)～(7)は各ステップを示す。

【0078】まず、プリンタ装置103はネットワークボード420を介して印刷ジョブの受信を行う。印刷ジョブを受信したときジョブ管理モジュール603が起動される。ジョブ管理モジュール603が起動されると、図10に示したジョブ管理テーブルにジョブの管理データを登録する(1)。このとき、ジョブID1001、通知先プロトコル1002、通知先アドレス1003、通知先ポート番号1004をRAM403に確保されるジョブ管理モジュール603に保存する。

【0079】そして、ジョブ管理モジュール603はジョブ管理テーブルのジョブ状態1005をスプール中にして、図11に示したような通知パケットを生成する。このとき、通知フラグ1101を「ON」、通知先プロトコルタイプ1102、通知先プロトコルアドレス1103、通知先ポート番号1104、ジョブID1105は先に保存したジョブ管理テーブルを参照してセットして、ネットワークボード420に対し、ジョブ状態「ジョブスプール中」を送信する(2)。

【0080】次に、ジョブ管理モジュール603は、各モジュールからプリンタ装置103の状態の監視を開始し(3)、また、プリンタエンジンドライバモジュール601や描画モジュール602からエラーの通知を受けたかどうかを判断し(4)、エラーの通知を受けたと判断した場合には、ジョブ管理モジュール603はジョブ管理テーブルから該当するジョブID1001に対してジョブエラーを通知するようネットワークボード420

に通知パケットを送出して(8)、ステップ(3)へ戻る。

【0081】一方、ステップ(4)で、エラー通知を受けていないと判断した場合は、プリンタエンジンドライバモジュール601からジョブの印刷終了の通知を受けたかどうかを判断し(5)、印刷終了通知を受けていないと判断した場合には、ステップ(3)へ戻る。

【0082】一方、ステップ(5)で、エラー通知を受けていると判断した場合には、ジョブ管理モジュール603はジョブ管理テーブルから該当するジョブID1001に対して、印刷終了の通知パケットをネットワークボード420に送出し(6)、該送出後、プリンタ装置103のRAM403上に確保されているジョブ管理テーブルから該当するジョブIDを削除して(7)、処理を終了する。

【0083】なお、本実施形態では図示していないが、ネットワークボード420からジョブの状態を要求するジョブステータス要求パケット901をコンピュータ装置101より受信した場合には、ジョブ管理モジュール603は該当するジョブID1001を検索し、そのジョブ状態1005をネットワークボード420に返信する。このとき、通知フラグ1101をOFFにすることで、これが応答のパケットであることを示す。

【0084】プリンタ装置103はジョブの開始時、ジョブのエラー時、ジョブの終了時に指定されたプロトコル、アドレスにそのジョブの状態を通知することにより、コンピュータ装置101のモニタリングアプリケーションモジュール305のモニタリング動作のイベントとしている。

【0085】図16は、本発明に係る印刷システムにおける第4のデータ処理手順の一例を示すフローチャートであり、図4に示したネットワークボード420のジョブ通知モジュール505の処理手順に対応する。なお、(1)～(10)は各ステップを示す。

【0086】まず、ジョブ通知モジュール505は電源投入と同時に起動し、ジョブ通知モジュール505が起動すると、ネットワークプロトコル通信モジュール503とプリンタI/Fドライバモジュール501に対し受信要求を行い(1)、ネットワーク102からのデータやプリンタ装置103からのパケットを受信できるようにする。ジョブ通知モジュール505はパケットの受信待ちを行い(2)、プリンタI/Fドライバモジュール501からパケットを受信したかどうかを判断し

(3)、プリンタI/Fドライバモジュール501からパケットを受信したと判断した場合には、ジョブ通知モジュール505はそれが通知パケットかどうかパケットの通知フラグ1101から判断し(4)、通知パケットであったと判断した場合には、図8に示したネットワーク通知パケット800を作成し(5)、パケット内の通知先プロトコルタイプ1102、通知先プロトコルアド

レス1103、通知先ポート番号1104宛てに該作成したネットワーク通知パケット800を送信して

(6)、ステップ(1)へ戻って、ジョブ通知モジュール505は送信が終了すると再び、受信要求をプリンタI/Fドライバモジュール501に発行して(1)、受信待ちとなる(2)。

【0087】一方、ステップ(4)で、通知パケットでないと判断した場合には、印刷ジョブ応答パケット904を作成し、該印刷ジョブ応答パケット904をネットワーク102を介してコンピュータ装置101に送信して(7)、ステップ(1)へ戻って、ジョブ通知モジュール505は送信が終了すると、再び受信要求をプリンタI/Fドライバモジュール501に発行して(1)、受信待ちとなる(2)。

【0088】一方、ステップ(3)で、プリンタI/Fドライバモジュール501からパケットを受信していないと判断した場合、すなわち、ネットワークプロトコル通信モジュール503からデータを受信したと判断した場合には、それがステータス要求パケット(印刷状態要求パケット901)かどうかをジョブ通知モジュール505が判断し(8)、ステータス要求パケットであったと判断した場合には、プリンタ装置103にステータス要求パケットを送信し(9)、ステップ(1)へ戻って、受信要求をネットワークプロトコル通信モジュール503に発行して、受信待ちとなる。

【0089】一方、ステップ(8)で、ステータス要求パケット以外のパケットであると判断した場合には、当該パケットを破棄して(10)、ステップ(1)へ戻って、受信要求をネットワークプロトコル通信モジュール503に発行して、受信待ちとなる。

【0090】以上のような処理の流れによって、ネットワークボード420のジョブ通知モジュール505はプリンタ装置103からのネットワーク通知パケット800をネットワーク102先のコンピュータ装置101に送信する。また、コンピュータ装置101からの印刷状態要求パケット901をプリンタ装置103に送出し、プリンタ装置103からのステータスをコンピュータ装置101に送信する。

【0091】以下、本実施形態の特徴的構成について図12～図16等を参照してさらに説明する。

【0092】上記のように構成された所定の通信媒体を介してデータ処理装置(コンピュータ装置101と印刷装置(プリンタ装置103)とがパケット通信可能な印刷システムの状態監視方法であって、あるいは所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視を制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先(図7に

示した通知先プロトコルアドレス7.04)を含む印刷ジョブを作成する作成工程(図12のステップ(3))と、該作成された印刷ジョブを前記印刷装置に送信する送信工程(図12のステップ(3))と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程(図14のステップ(8))、(11)、(13)、(14))と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程(図13のステップ(3))と、前記データ処理装置から受信される印刷ジョブを解析する解析工程(図15のステップ(1))の前工程であって図示しない)と、前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程(図15のステップ(1))と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程(図16のステップ(5))、(6))と、前記第1の通知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程(図16のステップ(7))とを有するので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置の状態を確実に通知する環境を自在に整備することができる。

【0093】〔第2実施形態〕上記第1実施形態では、ネットワークボード420を介してプリンタ装置103とコンピュータ装置101の通信を行ったが、ネットワークボード420内のジョブ通知モジュールおよび、ネットワークドライバを有するプリンタ装置103が直接コンピュータ装置101と通信を行ってもよい。

【0094】また、本実施形態ではジョブ管理テーブルをプリンタ装置103が管理していたが、このテーブルをネットワークボード420で管理し、プリンタ装置103に異常があった場合にはネットワークボード420から通知パケットを送出しても同様の効果を上げることができる。

【0095】以下、図17に示すメモリマップを参照して本発明に係る印刷システムで読み出し可能なデータ処理プログラムの構成について説明する。

【0096】図17は、本発明に係る印刷システムで読み出し可能な各種データ処理プログラムを格納する記憶媒体のメモリマップを説明する図である。

【0097】なお、特に図示しないが、記憶媒体に記憶されるプログラム群を管理する情報、例えばバージョン情報、作成者等も記憶され、かつ、プログラム読み出し側のOS等に依存する情報、例えばプログラムを識別表示するアイコン等も記憶される場合もある。

【0098】さらに、各種プログラムに従属するデータも上記ディレクトリに管理されている。また、各種プログラムをコンピュータにインストールするためのプログラムや、インストールするプログラムが圧縮されている場合に、解凍するプログラム等も記憶される場合もある。

【0099】本実施形態における図12、図13、図14、図15、図16に示す機能が外部からインストールされるプログラムによって、ホストコンピュータにより遂行されていてもよい。そして、その場合、CD-ROMやフラッシュメモリやFD等の記憶媒体により、あるいはネットワークを介して外部の記憶媒体から、プログラムを含む情報群を出力装置に供給される場合でも本発明は適用されるものである。

【0100】以上のように、前述した実施形態の機能を実現するソフトウェアのプログラムコードを記録した記憶媒体を、システムあるいは装置に供給し、そのシステムあるいは装置のコンピュータ(またはCPUやMPU)が記憶媒体に格納されたプログラムコードを読み出し実行することによっても、本発明の目的が達成されることは言うまでもない。

【0101】この場合、記憶媒体から読み出されたプログラムコード自体が本発明の新規な機能を実現することになり、そのプログラムコードを記憶した記憶媒体は本発明を構成することになる。

【0102】プログラムコードを供給するための記憶媒体としては、例えば、フロッピーディスク、ハードディスク、光ディスク、光磁気ディスク、CD-ROM、CD-R、磁気テープ、不揮発性のメモ리카ード、ROM、EEPROM等を用いることができる。

【0103】また、コンピュータが読み出したプログラムコードを実行することにより、前述した実施形態の機能が実現されるだけでなく、そのプログラムコードの指示に基づき、コンピュータ上で稼働しているOS(オペレーティングシステム)等が実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0104】さらに、記憶媒体から読み出されたプログラムコードが、コンピュータに挿入された機能拡張ボードやコンピュータに接続された機能拡張ユニットに備わるメモリに書き込まれた後、そのプログラムコードの指示に基づき、その機能拡張ボードや機能拡張ユニットに備わるCPU等が実際の処理の一部または全部を行い、その処理によって前述した実施形態の機能が実現される場合も含まれることは言うまでもない。

【0105】

【発明の効果】以上説明したように、本発明に係る第1の発明によれば、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段とを前記データ処理装置に備えるので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができる。

【0106】第2の発明によれば、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、前記解析手段が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段とを前記印刷装置に備えるので、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置の状態を確実に通知する環境を自在に整備することができる。

【0107】第3の発明によれば、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムであって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換する変換手段と、前記変換手段により変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを前記印刷装置に送信する送信手段と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する監視手段と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記監視手段による前記印刷装置の状態監視の開始または終了を制御する制御手段とを前記データ処理装置に備え、前記データ処理装置から受信される印刷ジョブを解析する解析手段と、前記解析手段

が解析して得られる前記印刷装置の状態を通知する通知アドレスを記憶する記憶手段と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記記憶手段に記憶された前記通知アドレスに従う前記データ処理装置に送信する送信手段と、前記送信手段による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知するように前記送信手段を制御する制御手段とを前記印刷装置に備えるので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置の状態を確実に通知する環境を自在に整備することができる。

【0108】第4の発明の発明によれば、前記変化する前記印刷装置の状態は、前記印刷ジョブに基づく印刷開始、印刷終了、前記印刷装置の異常を含むので、印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置が受信した印刷ジョブの印刷開始、印刷終了、前記印刷ジョブ中に発生する前記印刷装置の異常状態を確実に通知する環境を自在に整備することができる。

【0109】第5、第6の発明によれば、所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視方法であって、あるいは所定の通信媒体を介してデータ処理装置と印刷装置とがパケット通信可能な印刷システムの状態監視を制御するコンピュータが読み出し可能なプログラムを格納した記憶媒体であって、アプリケーションからのデータを所定のプリント言語に基づく印刷データに変換された前記印刷データおよび前記印刷データに基づくパケット通知先を含む印刷ジョブを作成する作成工程と、該作成された印刷ジョブを前記印刷装置に送信する送信工程と、前記印刷装置から受信するパケットを解析して前記印刷装置の状態を監視して監視内容を表示部に表示する表示工程と、前記印刷データの送信後、前記印刷装置から受信するパケットを解析して前記印刷装置の状態監視を開始または終了する監視工程と、前記データ処理装置から受信される印刷ジョブを解析する解析工程と、前記解析工程が解析して得られる前記印刷装置の状態を通知する通知アドレスをメモリに登録する登録工程と、前記印刷ジョブに基づく前記印刷装置の状態を通知するパケットを前記メモリに登録された前記通知アドレスに従う前記データ処理装置に通知する第1の通知工程と、前記第1の通

知工程による前記パケットに通知後、前記データ処理装置から受信するパケットを解析して変化する前記印刷装置の状態を示す応答パケットを順次前記データ処理装置に対して通知する第2の通知工程とを有するので、印刷装置からのパケットを受信するイベントを捉えて印刷装置の状態監視処理の開始及び終了を制御でき、従来のユーザによる印刷装置の状態モニタ操作指示がなされない場合でも、印刷装置の現在の状態変化を表示部で容易に確認することができるとともに、印刷装置の状態を通知すべき転送先を確実に管理して、現在処理中の印刷ジョブを転送してきたデータ処理装置に印刷装置の状態を確

実に通知する環境を自在に整備することができる。
【0110】従って、ユーザからの印刷ジョブを転送した印刷装置側が該印刷ジョブを処理する際に変化する印刷装置の状態を通知すべき通知先を管理して、適時パケットを管理するデータ処理装置に転送して、ユーザによる操作指示を強いることなく、転送した印刷ジョブを受信している印刷装置の状態を表示部に表示させる監視処理を自動化することができる等の効果を奏する。

【図面の簡単な説明】

【図1】本発明の第1実施形態を示す印刷システムの構成を説明する図である。

【図2】図1に示したコンピュータ装置の内部構成の概略を示すブロック図である。

【図3】図1に示したコンピュータ装置のプログラム構成の概略を示すブロック図である。

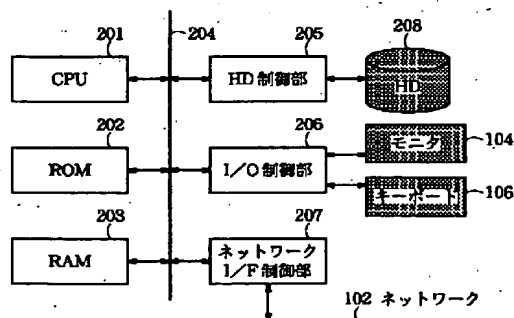
【図4】図1に示したプリンタ装置の内部構成の概略を示すブロック図である。

【図5】図4に示したネットワークボードのプログラム構成を示す概略図である。

【図6】図1に示したプリンタ装置のプログラム構成を示す概略図である。

【図7】図1に示したコンピュータ装置からプリンタ装置に送信される印刷ジョブデータのフォーマットを示す概略図である。

【図2】



【図8】図1に示したプリンタ装置のネットワークボードからコンピュータ装置に送信されるネットワーク通知パケットのフォーマットの一例を示す概略図である。

【図9】図1に示したコンピュータ装置がプリンタ装置の印刷状態を監視するパケットフォーマットの一例を示す概略図である。

【図10】図1に示したプリンタ装置のジョブ管理モジュールが管理しているジョブ管理テーブル一例を示す概略図である。

【図11】図1に示したプリンタ装置がネットワークボードに通知する通知パケットのフォーマットの一例を示す概略図である。

【図12】本発明に係る印刷制御装置を適用可能な印刷システムにおける第1のデータ処理手順の一例を示すフローチャートである。

【図13】本発明に係る印刷システムにおける第2のデータ処理手順の一例を示すフローチャートである。

【図14】本発明に係る印刷システムにおける第2のデータ処理手順の一例を示すフローチャートである。

【図15】本発明に係る印刷システムにおける第3のデータ処理手順の一例を示すフローチャートである。

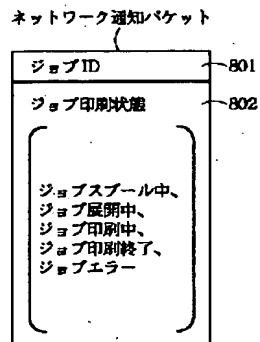
【図16】本発明に係る印刷システムにおける第4のデータ処理手順の一例を示すフローチャートである。

【図17】本発明に係る印刷システムで読み出し可能な各種データ処理プログラムを格納する記憶媒体のメモリマップを説明する図である。

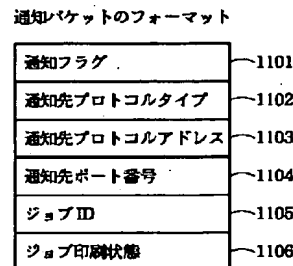
【符号の説明】

- 101 コンピュータ装置
- 102 ネットワーク
- 103 プリンタ装置
- 104 モニタ
- 201 CPU
- 202 ROM
- 203 RAM
- 207 ネットワーク I/F 制御部

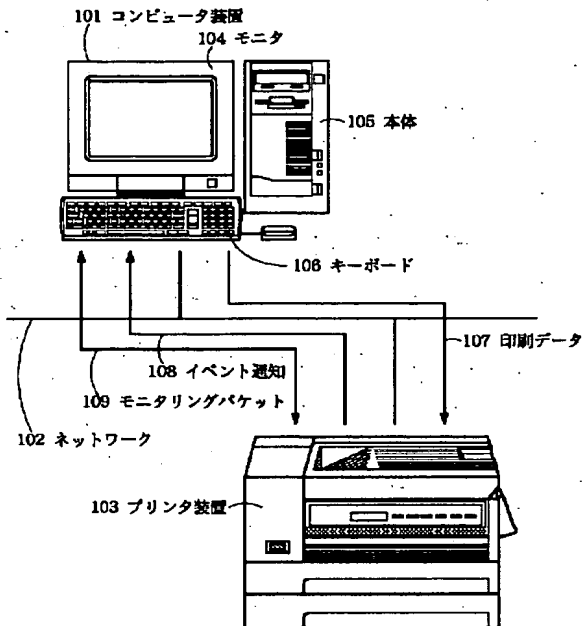
【図8】



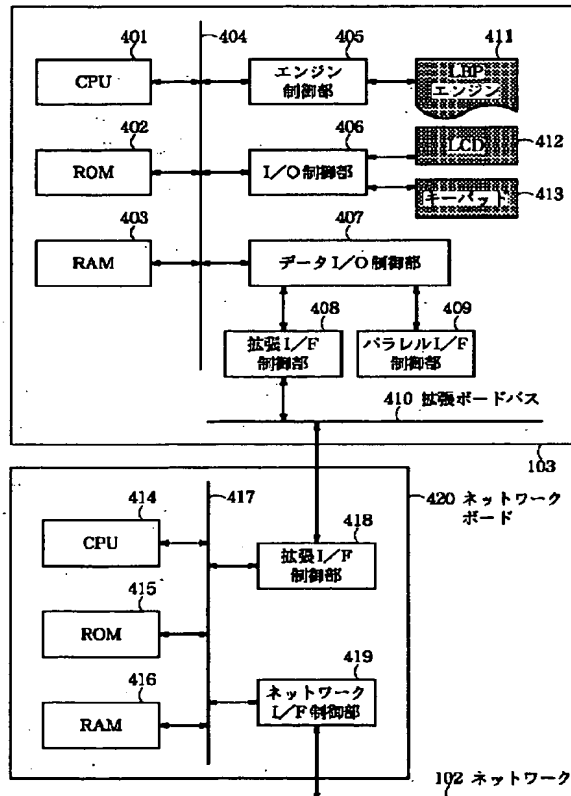
【図11】



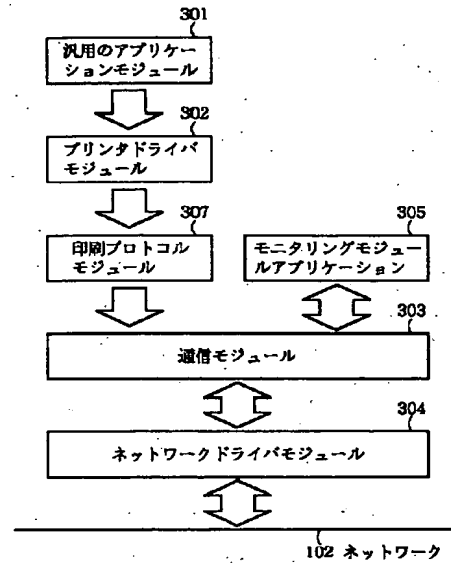
【図1】



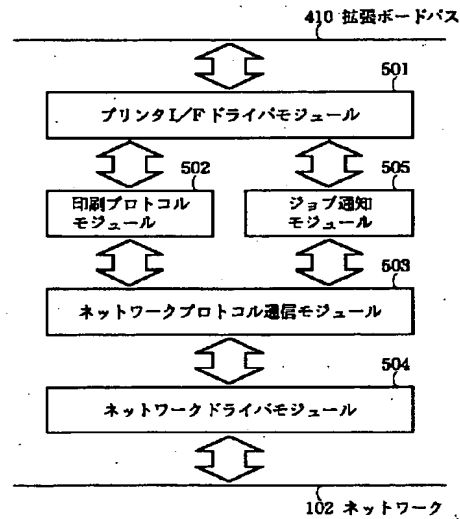
【図4】



【図3】



【図5】

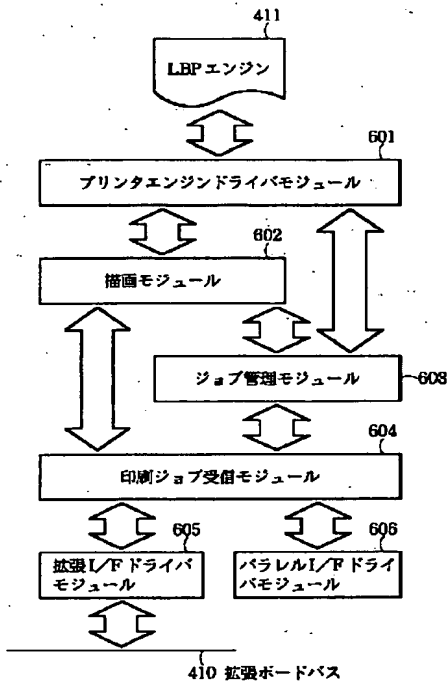


【図10】

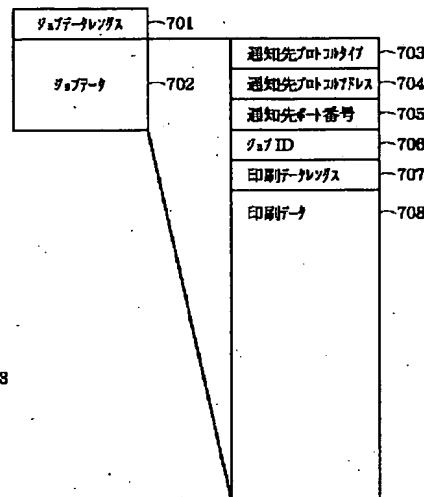
1001	ジョブID	1234	2233	3124
1002	通知先プロトコル	TCP/IP	TCP/IP	TCP/IP
1003	通知先アドレス	192.1.2.155	192.1.2.168	192.1.2.121
1004	通知先ポート番号	9045	9045	9045
1005	ジョブ状態	スプール中	印刷中	展開中

ジョブ管理テーブル

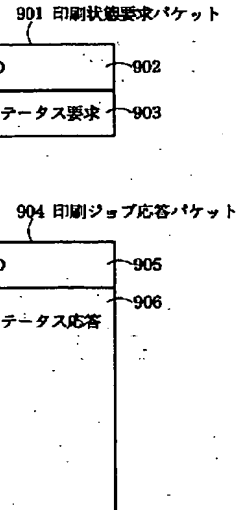
【図6】



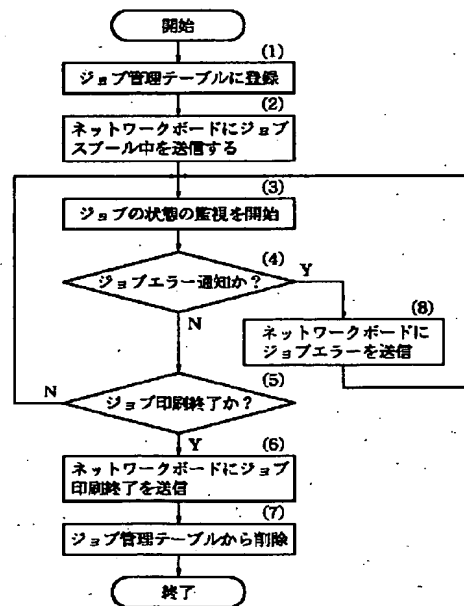
【図7】



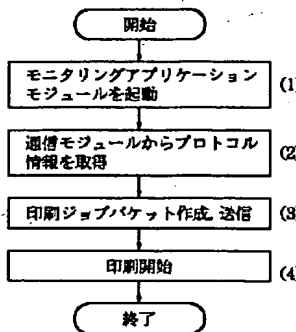
【図9】



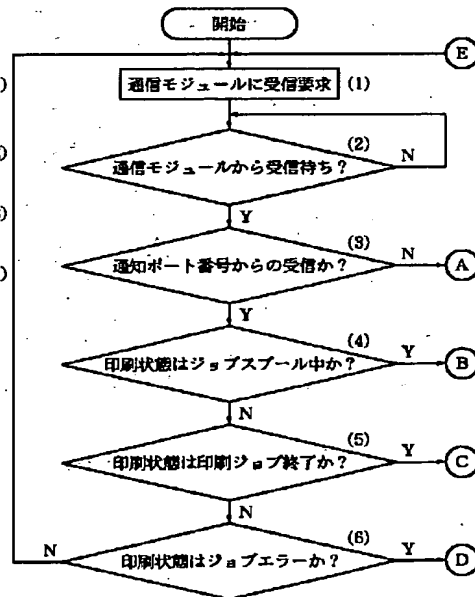
【図15】



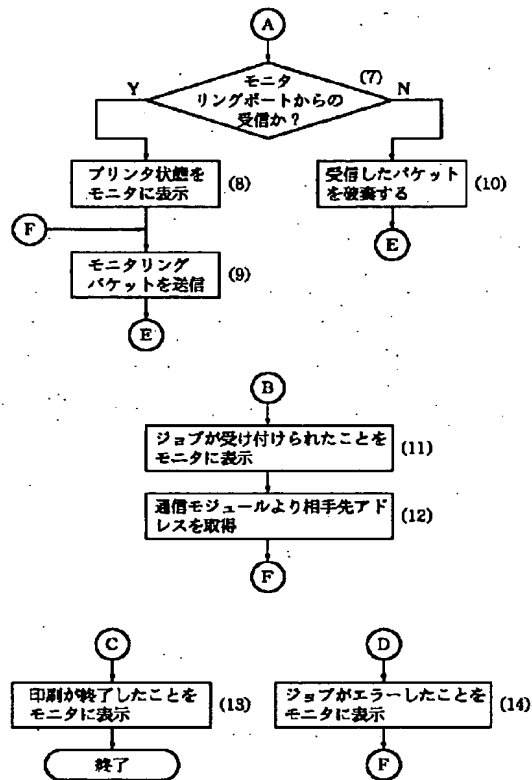
【図12】



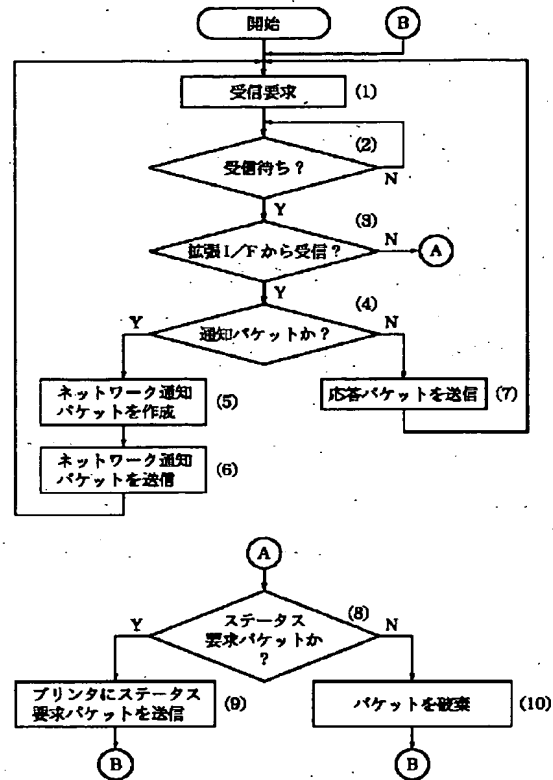
【図13】



【図14】



【図16】



【図17】

FD/CD-ROM等の記憶媒体

ディレクトリ情報
第1のデータ処理プログラム 図12に示すフローチャートのステップに対応するプログラムコード群
第2のデータ処理プログラム 図13,14に示すフローチャートのステップに対応するプログラムコード群
第3のデータ処理プログラム 図15に示すフローチャートのステップに対応するプログラムコード群
第4のデータ処理プログラム 図16に示すフローチャートのステップに対応するプログラムコード群

記憶媒体のメモリマップ